


## CRITICAL NOTES ON BAMBOOS FROM FLORES ISLAND

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### ABSTRACT

WIDJAJA, E. A., LARASATI, I. & SUKAESIH, Y. Y. 2025. Critical notes on bamboos from Flores Island. *Reinwardtia* 24(1): 41–50. — Based on the results of extended field exploration, including the taxonomic study of bamboo growing in Flores, two new species, namely *Dinochloa nigroviolacea* and *Gigantochloa kelimutuense* will be described and illustrated. It was also observed that the Timorese black bamboo *Gigantochloa lako*, which has not been reported before from Flores, was found growing wild in the interior of Ende Regency. Furthermore, our studies indicated that *Chloothamnus schmutzii* should be reduced to synonymy of *Chloothamnus reholtmianus*, which grows wild and has spread from Ngada Regency to West Manggarai Regency; this species is also found in East Sumba and Sumbawa. The results of our observations indicate that at present there are 17 species of bamboo growing in Flores, belonging to *Bambusa* (four species), *Chloothamnus* (one species), *Dendrocalamus* (one species), *Dinochloa* (two species), *Fimbribambusa* (one species), *Gigantochloa* (4 species), *Phyllostachys* (1 species), *Schizostachyum* (two species), and *Thyrsostachys* (one species). They can be distinguished using the key provided.

**Key words:** *Chloothamnus reholtmianus*, *Chloothamnus schmutzii*, *Dinochloa nigroviolacea*, Flores, *Gigantochloa kelimutuense*, *Gigantochloa lako*.

### ABSTRAK

WIDJAJA, E. A., LARASATI, I. & SUKAESIH, Y. Y. 2025. Catatan penting pada bambu Kepulauan Flores. *Reinwardtia* 24(1): 41–50. — Berdasarkan hasil eksplorasi lapangan termasuk penelitian taksonomi pada bambu yang tumbuh di Flores, dua jenis baru, yaitu *Dinochloa nigroviolacea* dan *Gigantochloa kelimutuense*, akan diperlakukan dan digambarkan. Pengamatan pada bambu hitam Timor (*Gigantochloa lako*), yang sebelumnya tidak pernah dilaporkan ada di Flores, ditemukan tumbuh liar di pedalaman Kabupaten Ende. Selanjutnya, penelitian ini menunjukkan bahwa *Chloothamnus schmutzii* sebaiknya dijadikan sinonim dari *Chloothamnus reholtmianus*, yang juga tumbuh liar dan menyebar dari Kabupaten Ngada ke Kabupaten Manggarai Barat; selanjutnya jenis ini juga ditemukan di Sumba Timur dan Sumbawa. Berdasarkan hasil pengamatan menunjukkan bahwa saat ini terdapat 17 jenis bambu yang tumbuh di Flores, yang termasuk dalam marga *Bambusa* (empat jenis), *Chloothamnus* (satu jenis), *Dendrocalamus* (satu jenis), *Dinochloa* (dua jenis), *Fimbribambusa* (satu jenis), *Gigantochloa* (empat jenis), *Phyllostachys* (satu jenis), *Schizostachyum* (dua jenis), dan *Thyrsostachys* (satu jenis). Jenis-jenis tersebut dapat dibedakan dengan menggunakan kunci identifikasi yang sudah disediakan.

**Kata kunci:** *Chloothamnus reholtmianus*, *Chloothamnus schmutzii*, *Dinochloa nigroviolacea*, Flores, *Gigantochloa kelimutuense*, *Gigantochloa lako*.

## INTRODUCTION

Flores is one of the eastern islands in the Lesser Sunda Islands cluster. Bamboo is one of the very important natural resources on this island due to its historical significance, ecological role, and local economic importance. Flores hosts an impressive variety of bamboo species, each exhibiting unique adaptations that allow them to thrive in diverse habitats, which is crucial for local biodiversity. Bamboo plays a central role in spiritual rituals and social customs, where it is

offered in ceremonies and festivals, reflecting its importance to the human community.

Meanwhile, the bamboo biodiversity of Flores was explored by Father Schmutz, who made a botanical collection in West Manggarai and documented it in *Die Flora der Manggarai* vol. 1–5 (1976). Unfortunately, this book was never published, and only a copy is kept in the Diocese of Manggarai and at the Herbarium Bogoriense and Leiden Herbarium. He mentioned that there were six species of bamboo (*belang*, *beto*, *helung*, *heso*, *gurung*, *pering*) growing in West Manggarai. Af-



Fig. 1. *Dinochloa nigroviolacea* Widjaja & Larasati. A. Habit. B. Culm sheath. C. Culm sheath base. D. Young shoot. E. Leaf sheath. Photos by Elizabeth A. Widjaja.

ter that, there was no more information on bamboo diversity in Flores until Widjaja (1998), Widjaja (2002), and Widjaja & Larasati conducted bamboo hunting in Flores in 2022, although some areas have not been thoroughly explored. Currently, there are 17 species of bamboo growing in Flores. *Fimbribambusa jokowii* was published by Widjaja (2023), and two other species that were collected are now being published. Additionally, a new distribution record of black Timor bamboo in Flores was discovered and published (Cai *et al.*, 2024). Furthermore, *Nastus reholtumianus* and *N. schmutzii* were recollected, and it was discovered that both taxa are conspecific.

## MATERIALS AND METHODS

Fieldwork from the east to the west of Flores Island, East Nusa Tenggara, was conducted in August–September 2022. Studies of herbarium material were carried out in the Herbarium Bogoriense from October 2022 to December 2023, where the two new species, new record and *Chloothamnus* spp. were investigated. All herbarium specimens were deposited with the Herbarium Bogoriense (BO).

## RESULT AND DISCUSSION

### TWO NEW SPECIES

Two new bamboo species, *Dinochloa nigroviolacea* and *Gigantochloa kelimutuense*, were discovered during the Flores bamboo expeditions. These species grow wild in the interior forest of Flores.

***Dinochloa nigroviolacea* Widjaja & Larasati, spec. nov.** (Figs. 1, 2) — TYPE: INDONESIA. East Nusa Tenggara Province, Manggarai, Satarinese Barat Sub Regency, Satar Lenda Village, footpath to Wae Rebo traditional community,

909.8 m asl., 8°47'16.65" S, 120°17'18.74"E, 12 September 2022, secondary forest, Elizabeth A. Widjaja & Isti Larasati, EAW 10154 (holotype: BO-1993213; isotypes: BO-1993214, BO-1993215, BO-1993216 (All BO!)).

**Diagnosis.** This bamboo is closely related to *Dinochloa kostermansiana* in having white wax covering the young shoot, deflexed culm sheath blades, and culm sheath auricles curved outward with several long bristles. The new species differs by its young shoot with only sparing white wax, short white hairs on the young and old culms, culm sheath base with dense yellowish hairs especially when young, and culm sheath blade broadly ovate and longer than the sheath proper, as well as culm sheath auricles with long and dense bristles.

**Description.** Culm shoot green, with white hairs covering its sheaths, white wax scanty on the sheaths. Culms climbing onto adjacent trees up to 60 m long, nodes with rough extended sheath base covered by long and dense yellowish hairs when young that may be caducous when old; culms black when mature with scattered white hairs on the surface, internodes 26–40 cm, diameter 1–2 cm. Culm sheaths caducous, densely covered with white hairs, base with dense yellowish and long hairs; blades 6.4–9 × 0.3–2.1 cm, broadly lanceolate, 3–9 cm wide at the junction with the sheath proper, deflexed, longer than the sheath; auricles rounded, curved outward, 1–6 mm × 4–9 mm, margins with long and dense bristles 4–9 mm; ligule entire, very short, up to 1 mm, bristles very few, up to 5 mm long. Leaf blades 14.5–27.7 × 1.9–4.5 cm, glabrous; auricles 1–4 mm, rounded and curved outward, easily broken, bristles 6–16 mm long; ligule lacinate, with short bristles up to 1 mm long; leaf apex acuminate with long pointed tips 0.6–1.2 cm long; base asymmetric, somewhat rounded; pe-tioles sessile or short; sheath blackish, scanty white waxy. Inflorescence not seen.

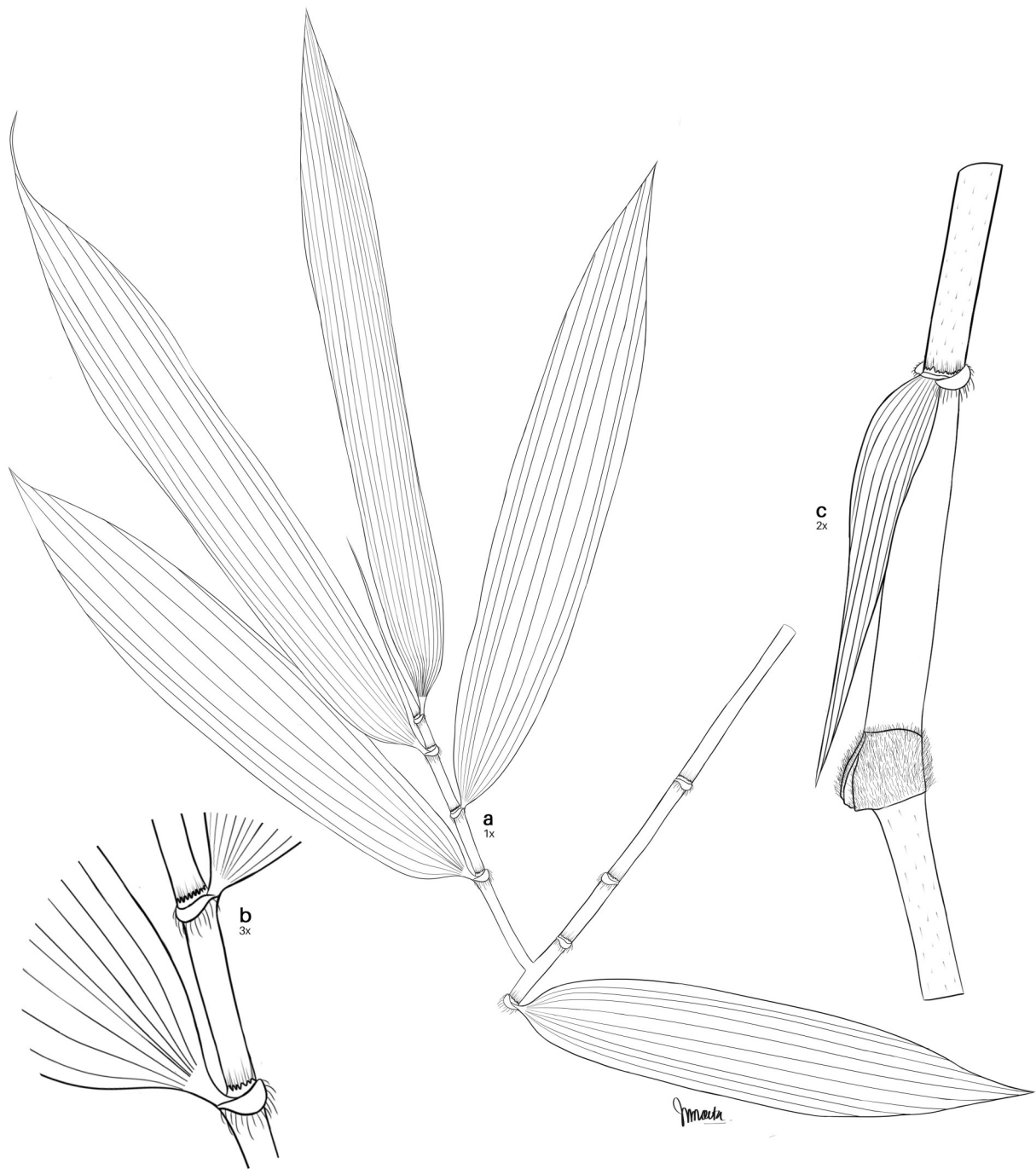


Fig. 2. *Dinochloa nigroviolacea* Widjaja & Larasati. A. Leaves. B. Leaf sheath. C. Culm sheath. Illustrated by Ni Made Chandra Oktavia Devi.

**Distribution.** Found only in the forest of Wae Rebo footpath, and near the Sano Nggoang Lake.

**Etymology.** The name *nigroviolacea* is proposed as, so far, there is no documentation of black purplish culms for *Dinorchloa*.

**Phenology.** Not known.

**Ecology.** Growing at the higher elevations at 650–1,000 m asl., the mountainous area from Wae Rebo to Sano Nggoang is a series of mountainous areas.

**Vernacular names.** The local people called it Bambu Tali or sometimes Bambu Tali Ungu.

**Uses.** The local people use them for string if they do not find another plant for string.

**Notes.** The discovery of this species is the first time a black climbing bamboo has been found. This species is not very abundant and only found in two areas and not more than 10 ha in extent, so it is suggested to include it as an endangered species; especially in Sano Nggoang, which was found only along the road to the slope of the lake.

**Specimens examined.** INDONESIA. East Nusa Tenggara, Manggarai, Satar Mese Barat subdistrict, Satar Lenda, footpath to Wae Rebo traditional village, 8°47'16.65"S, 120°17'18.74"E, 909.8 m asl., 12 September 2022, secondary forest, *Elizabeth A. Widjaja & Isti Larasati EAW 10154* (BO!); East Nusa Tenggara, Manggarai, Satar Mese Barat subdistrict, Satar Lenda, 8°47'15"S, 120°17'16.2" E, 935.2 m asl., 12 September 2022, secondary forest, *Elizabeth A. Widjaja & Isti Larasati EAW 10155* (BO!); East Nusa Tenggara, Manggarai, Satar Mese Barat subdistrict, Satar Lenda, 8°47'10.46"S, 120°17'15.08"E, 968.3 m asl., 12 September 2022, secondary forest, *Elizabeth A. Widjaja & Isti Larasati EAW 10156* (BO!); East Nusa Tenggara, Manggarai, Satar Mese Barat subdistrict, Satar Lenda, 8°47'10.46"S, 120°17'15.08" E, 968.4 m asl., 12 September 2022, secondary forest, *Elizabeth A. Widjaja & Isti Larasati EAW 10157* (BO!); East Nusa Tenggara, Manggarai Barat, Sano Nggoang Subdistrict, Wae Sano Village, 8°42'2.34"S, 119°59'42.12"E, 677.5 m asl., 15 September 2022, along the road, disturbed forest, *Elizabeth A. Widjaja & Isti Larasati EAW 10167* (BO!).

***Gigantochloa kelimutuense* Widjaja & Larasati spec. nov.** (Figs. 3, 4) — TYPE: INDONESIA. East Nusa Tenggara Province, Ende, Woloara Village, Kelimutu mountainous area, 1,016.9 m asl., 8°45'14.93"S, 121°49'55.65"E, 28 August 2022, flowering, secondary forest, *Elizabeth A. Widjaja*

& *Isti Larasati EAW 10118* (holotype: BO–1993 205; isotypes: BO–1993206, BO–1993207, BO–1993208, BO–1993209, BO–1993210, BO–1993 211, BO–1993212 (All BO!)).

**Diagnosis.** This species closely related to *Gigantochloa lako*, characterized by erect lanceolate culm sheath blade with short basal joint to the sheath apex, culm sheath auricles small and curving outward, glabrous and not reaching the blade base. Culms with scattered white hairs when young and yellowish stripes. Pseudospikelets slender.

**Description.** *Clumps* loosely tufted. *Young shoots* slender, green, glabrous with scattered white hairs. *Culms* erect, up to 15 m, diameter 2–4.5 cm, green when young with black or yellow stripes, culm wall up to 6 mm thick, the longest internodes 25–40 cm, colour evenly light green. Young culms light green with yellow stripes when young, and turning dark green when older, sometimes looking blackish. Culm sheaths glabrous to covered with scattered white hairs, caducous; auricles rounded, curving outward, 1–3 × 1–3 mm, glabrous; ligule entire, up to 2 mm, glabrous; blade erect, 4.4–5.8 × 1.2–1.3 cm, lanceolate with acuminate tip, basally with 1.1 cm wide joint to the sheath apex. *Leaf-blades* lanceolate, apex acuminate up to 1.6 cm long, 18–15 × 1.6–2.2 cm, glabrous; base symmetric; petiole up to 0.2–0.5 cm long, auricles rim-like, 0.1 cm tall, glabrous; ligule entire, glabrous, 1 mm tall. *Pseudospikelet* groups about 5–7 in a cluster, ovate-lanceolate, slender, 24–31 mm long by 3–5 mm wide, consisting of 3 perfect florets; glume acute mucronate at the apex without cilia, 6–8 mm long; lemmas with light brown cilia on the margins, 8–14 mm long; palea linear, bifid at the top with light brown cilia, 7–15 mm long, longer than lemma; lodicules 3.5 mm long; anther magenta. Caryopsis not seen.

**Distribution.** This bamboo is found growing wild in the type locality, and only eight clumps were seen.

**Etymology.** The name *kelimutuense* is proposed because this bamboo grows along an outlet stream of Kelimutu Lake in the Kelimutu Subdistrict.

**Phenology.** Only one clump was in flower.

**Ecology.** This bamboo grows along the outlet streams of Kelimutu lake, so it seems resistant to the sulphur.

**Vernacular names.** No name documented.

**Uses.** Local people have not used this bamboo.



**Notes.** This species is closely related to *Gigantochloa lako* but differs by its long erect culm sheath blade with small glabrous auricles and young shoots with scattered white hairs. Pseudospikelet slender, with present lodicules. *Gigantochloa lako* has erect triangular culm sheath blades, bigger auricles with short bristles, and the auricles extend to the base of the blade; also, its young shoots are subglabrous with only very scattered black hairs. Pseudospikelet flat, and lodicule absent. Because it is only found in one locality and only 8 clumps, it is suggested as endangered.

**Specimen examined.** INDONESIA. East Nusa Tenggara, Ende, Kelimutu Subdistrict, Woloara Village, Kelimutu mountainous area, 8°45'14.93" S, 121°49'55.65"E, 1,016.9 m asl., 28 August 2022, secondary forest, *Elizabeth A. Widjaja & Isti Larasati EAW 10118* (BO!).

#### A NEW DISTRIBUTION RECORD OF *GIGANTOCHLOA LAKO*

Timor black bamboo had not been recorded for Indonesia. Still, recently, local communities reported to the Environmental Bamboo Foundation that this species also grows in the interior of Flores Island and West Timor as well. This information has been reported in the publication by Cai *et al.* (2024).

*Gigantochloa lako* (Widjaja) Z.Y.Cai & Widjaja

**Distribution.** This bamboo was first described as originating from Timor Leste (Widjaja, 1997); now, this species is also known from Indonesia, that is Kefamenanu, Timor Tengah Utara Regency, East Nusa Tenggara. Moreover, this species also grows in the interior of Ende Regency Forest (Cai *et al.*, 2024).

**Phenology.** Not in flower.

**Ecology.** Disturbed forest and very dry areas of the interior.

**Vernacular names.** *Au lako*, *au metan*, *au meta*, or *au lako meta* (Tetun, Timor Leste, Lio Ende).

**Uses.** Culms are used for building structures (roofing and walls) and traditional furniture. Introduced to Australia in 1970 from Timor as an ornamental plant, it is now spread all over the tropics.

**Notes.** This species was originally named *Bambusa lako* Widjaja but after the flowers were found, then it was transferred to *Gigantochloa lako* by Cai *et al.* (2024) due to the presence of a filament tube in the floret, and extremely short rachilla segments in the pseudospikelet. This species is quite abundant in the original locality, and there is an intention to

cultivate it in Timor Leste. It is also grown abundantly in West Timor, although it is not so much in Ende District. It has been cultivated around the world as an ornamental plant. It is suggested to be of vulnerable conservation status in the wild.

**Specimens examined.** INDONESIA. East Nusa Tenggara, Ende, Detukeli Subdistrict, Nggesabiri Village, 8°36'5.13"S, 121°51'28.46"E, 645 m asl., 15 May 2023, secondary forest, *Anastasia Yosepha Yuyun s.n.* (BO!); East Nusa Tenggara, Timor Tengah Utara District, Kota Kefamenanu 9°29'49.7"S, 124°29'24.5"E, 411.6 m asl., 18 November 2023, in the village, *Ikerniaty A. T. Sandili s.n.* (BO!).

#### REDUCTION OF *CHLOOTHAMNUS SCHMUTZII* INTO *C. REHOLTTUMIANUS*

In the publication of Widjaja & Wong (2016), it is shown that the Malesian *Nastus* has been recognized as three distinct genera: *Chloothamnus* Büse, *Ruhooglandia* (Holttum) S.Dransf. & K.M. Wong, and *Widjajachloa* K.M.Wong & S.Dransf. Therefore, the new combination was proposed for the *Nastus* in Flores to be *Chloothamnus reholttumianus* (S.Soenarko) Widjaja and *C. schmutzii* (S. Dransf.) Widjaja.

Soenarko (1977) published *Nastus reholttumianus*, which was collected as *Iboet 443* (9/5/1925) from the island of Sumba (Indonesia). According to her, *Schmutz 3866* represented the same species as *N. reholttumianus*. Three years later, Dransfield (1980) published *N. schmutzii*, represented by specimens gathered by Father Schmutz (*Schmutz 2789* and *Schmutz 3853*) from the same area but at a higher elevation (about 850 m). Therefore, according to her, *N. reholttumianus* grows in the lower elevation (based on the specimen *Schmutz 3866* and information from P. Erwin Schmutz), with smaller culm diameter, thin culm wall, and glume as long as lemma and palea.

During the bamboo exploration done in 2022, we collected those species in Ngada Regency, East Manggarai Regency, Manggarai, and West Manggarai in flower, and those species are difficult to distinguish morphologically from either *C. (N.) reholttumianus* or *C. (N.) schmutzii*. At Sano Nggoang Subdistrict, Father Schmutz apparently collected two different species, and it seems that both species grow mixed at both lower elevations of 800 m and above 900 m. Except for the culm size, all the morphological characters are very similar. However, we also learned from the local people that they recognized two different types of *Chloothamnus* which are called 'heso'. In the field, they mentioned there are two kinds of heso: 'heso latung' and 'heso mawo'. The one



Fig. 3. *Gigantochloa kelimutuense* Widjaja & Larasati. A. Habit. B. Branching system. C. Inflorescence. D. Culm sheath. Photos by Elizabeth A Widjaja.

with larger culms is called ‘*heso latung*’ (*latung* means corn, which implies that the diameter of the culm is about 5 cm or larger), on the other hand, that with smaller culms is called ‘*heso mawo*’ (*mawo* means rice, it implies that the diameter of the culm is less than 3 cm). To study those species, a second collection 79 years after the type collection of *N. reholtumianus* was made by Widjaja & Karsono (2005), along the way from Tanarara to Wanggameti National Park and from Wanggameti to Mau Maru until half-way to Melolo. Originally, this species was collected at Mangiliwari (correct name Mangili Wai) about 2 km away from Mao Marro (should be Mau Maru). Based on this collection, it is recorded that the culm diameter is also bigger, 2–6 cm. The collection was missing until now at BO.

After studying both type specimens, it was confirmed that they are the same species, now referred to *Chloothamnus reholtumianus*, which was published earlier than *C. schmutzii*. The difference in culm diameter probably only represents variety or form differences because in Sano Nggoang these taxa grow together side by side at the same elevation. Also, the glume in both species is somewhat shorter than the lemma, although the mature spikelet sometimes has glume that is as long as the lemma. The information for both types of *heso* is also confirmed by students of Father Schmutz, who met us (EAW & IL) in the field.

**Distribution.** This bamboo grows wild in Ngada, East Manggarai, Manggarai, and West Manggarai Regency. It is also found in East Sumba and Sumbawa (Damayanto *et al.*, 2020 mentioned this as *Chloothamnus schmutzii*; Damayanto (2024) mentioned the taxa as two different species).

**Phenology.** According to Schmutz (written on the specimen *Schmutz 2789*), it flowers once every 25 years. It was seen in flower at Ngada in September 2022. When EAW returned to that locality on 20 February 2024, the plant died and was producing seedlings until the publication of this paper.

**Ecology.** This bamboo grows on hillslopes or in valleys; it is also grown near streams or by the lake. In Sumba, it grows in the valleys of the savannah area. This species grows at elevations of 232–1,083 m asl.

**Vernacular names.** *Kesa* (East Manggarai), *heso* (Manggarai), *heso latung*, *heso mawo* (West Manggarai), *ropeng* (Sumbawa), *oro* (East Sumba).

**Uses.** Culms are rarely used because of the thin walls, but the small diameter is useful for bamboo drinking straws.

**Notes.** According to Chadburn (2020 a and b), *C. reholtumianus* is vulnerable, and *C. schmutzii* is not threatened. Now that it is decided that these taxa are synonymous, we can still state that *C. reholtumianus* is vulnerable. This species is still grown in many different areas on hillslopes or in valleys from Ngada to West Manggarai, East Sumba, West Sumbawa. In East Sumba, this bamboo grows abundantly.

**Specimens examined.** INDONESIA. East Nusa Tenggara, Ngada, Aimere Subdistrict, Lekogoko Village, 8°49'27.95"S, 120°54'43.39"E, 694.9 m asl., 8 September 2022, on the trans flores road to Aemere, disturbed forest, in flower and on 20 February 2024 clump died and producing seedling till now, Elizabeth A. Widjaja & Isti Larasati EAW 10143 (BO!); East Nusa Tenggara, East Manggarai, Kota Komba Subdistrict, Rana Mbeling

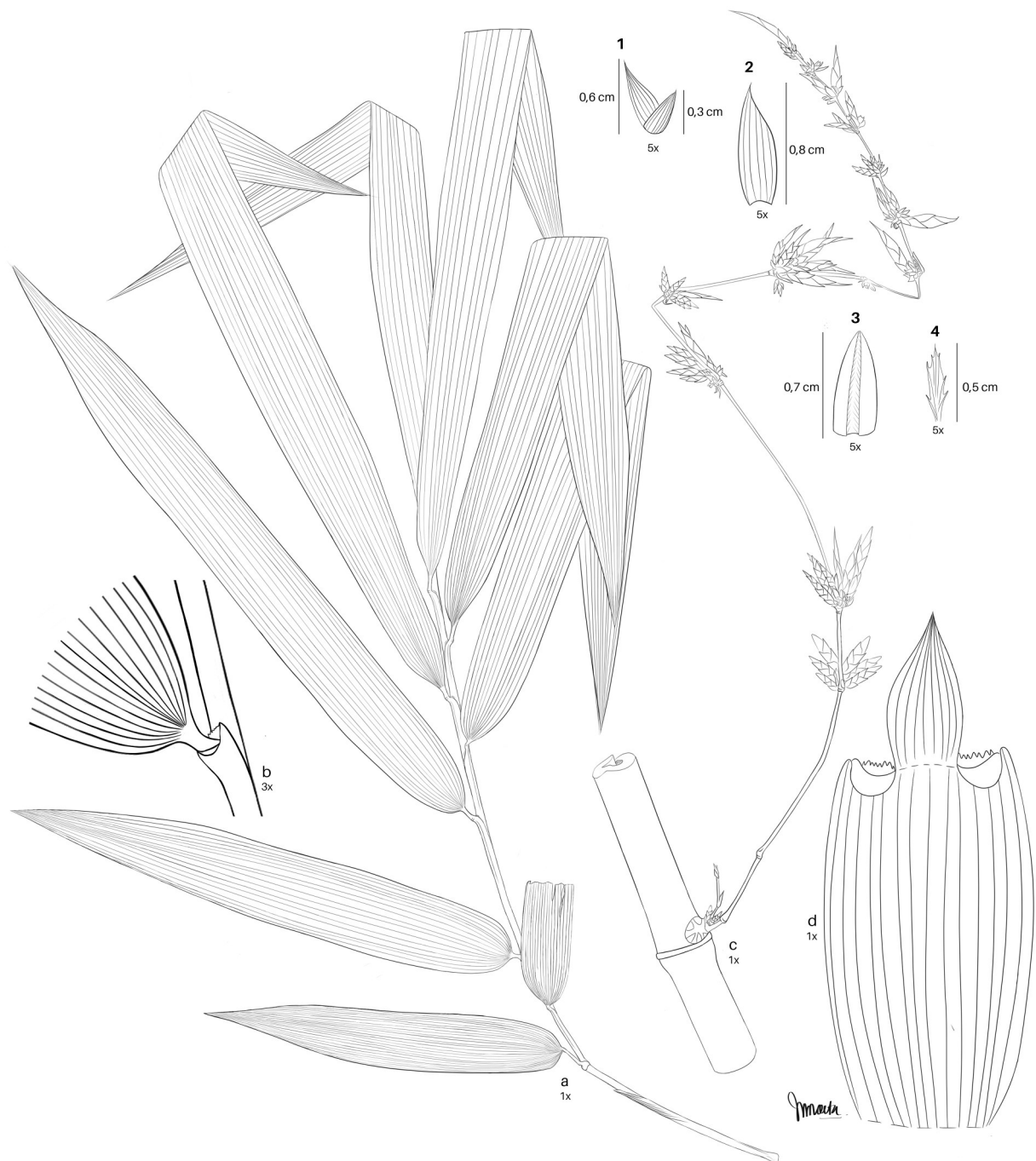


Fig. 4. *Gigantochloa kelimutuense* Widjaja & Larasati. a. Leaves. b. Leaf sheath. c. Inflorescence. d. Culm sheath. 1. Glume. 2. Lemma. 3. Palea. 4. Lodicule. Illustrated by Ni Made Chandra Oktavia Devi.

### Identification Key to Flores Bamboos

- 1a. Culms monopodial, branches 2, compressed internodes in the lower part of culm which mostly have a tortoise shell-like appearance ..... *Phyllostachys aurea*
- 1b. Culms sympodial, branches many, without compressed internodes in the lower part of the culm ..... 2
- 2a. Culms climbing to scrambling, node with thickened broad culm-sheath base or patella ..... 3
- 2b. Culms erect, straight, or zigzag, node without thickened broad culm-sheath base or patella ..... 6
- 3a. Culms climbing, node with thickened broad culm-sheath base, auricles rounded, curved outward with bristles, culm sheath blade deflexed ..... 4
- 3b. Culms scrambling, with patella or nodal line ring, auricles small to horn-like with bristle, culm sheath blade erect when young ..... 5
- 4a. Young shoot light green covered by copious white wax; culms glabrous. Culm sheath blade lanceolate, shorter than the sheath, glabrous on the culm sheath base. Leaf sheath auricles big, rounded and curved outward with many long bristles ..... *Dinochloa kostermansiana*
- 4b. Young shoot green to purplish covered by scanty waxy white, with scattered white hairs, culms covered by scattered white hairs. Culm sheath blade broadly ovate, longer than the sheath, culm sheath base covered by densely yellowish hairs. Leaf sheath auricles small, rounded and curved outward with only several bristles ..... *Dinochloa nigroviolacea*
- 5a. Young shoot covered densely with white wax, glabrous, culm node with patella. Culm sheath auricles horn like, with short bristles ..... *Fimbribambusa jokowii*
- 5b. Young shoot covered with scanty white wax, with white hairs on the culm sheath, culm node with nodal line. Culm sheath auricles small, erect with long brown bristles ..... *Chloothamnus reholtumianus*
- 6a. Culm zigzag ..... 7
- 6b. Culms straight ..... 10
- 7a. Culm lower branches with spines. Young shoot with white wax ..... *Bambusa blumeana*
- 7b. Culm lower branches without spines, young shoot without white wax ..... 8
- 8a. Culm sheath blade lanceolate, leaf green with white stripes ..... *Bambusa glaucophylla*
- 8b. Culm sheath blade broadly ovate to triangular, leaf green or sometimes with yellow stripes .... 9
- 9a. Culm sheath auricles big, rounded and curved outward. Culm sheath covered by light to dark brown hairs. Culm diameter more than 4 cm ..... *Bambusa vulgaris*
- 9b. Culm sheath auricles small, rim-like, culm sheath glabrous. Culm diameter about 1–2 cm ..... *Bambusa multiplex*
- 10a. Branches subequal, leaf sheath mostly having hairs ..... 11
- 10b. Branches with primary axis prominent, leaf sheath without hairs ..... 12
- 11a. Young shoot brownish green to brownish yellow with light brown hairs. Culm internodes 20–50 cm long, diameter 5–8 cm. Culm sheath blade erect, broadly ovate ..... *Schizostachyum brachycladum*
- 11b. Young shoot light green covered by white–yellowish hairs. Culm internodes 50–100 cm long, diameter less than 3 cm. Culm sheath blade deflexed, linear ..... *Schizostachyum silicatum*
- 12a. Culm sheath persistent with spreading white hairs, auricles inconspicuous, leaves linear ..... *Thyrsostachys siamensis*
- 12b. Culm sheath caducous with light to dark brown hairs, auricles small to big, rounded, leaves lanceolate ..... 13
- 13a. Culm sheath auricles big, rounded, mostly curved outward, with long bristles and wavy, reaching the blade base. Culm base covered with velvety brown hairs ..... *Dendrocalamus asper*
- 13b. Culm sheath auricles small, rounded, with short bristles, not wavy, not reaching the blade base. Culm sheath base green or with brown hairs below the node ..... 14
- 14a. Culm sheath auricle rounded with short bristles, culm sheath blade joint smaller than the blade itself ..... 15
- 14b. Culm sheath auricle small with or without bristles, culm sheath blade joint as much as the blade width ..... 16
- 15a. Dark green glossy mature culms. Brown hairs found below the node, culm sheath auricles joined to base of the blade ..... *Gigantochloa atter*
- 15b. Purplish mature culms. Glabrous or scattered white hairs below the node, culm sheath not auricles joined to base of the blade ..... *Gigantochloa atroviolacea*



- 16a. Young shoots medium green. Young culms green with black stripes., with white hairs. Culm sheath blade erect becoming spreading, culm sheath auricles not reaching blade base ..... *Gigantochloa kelimutuense*
- 16b. Young shoots light green. Young culms green with yellow stripes, glabrous. Culm sheath blade erects always, culm sheath auricles reaching blade base ..... *Gigantochloa lako*

Village, Lada Subvillage, 8°40'39.75"S, 120°43'3.32"E, 927 m asl., 9 September 2022, slope hill, *Elizabeth A. Widjaja & Isti Larasati EAW 10150* (BO!); East Nusa Tenggara, East Manggarai, Kota Komba Subdistrict, Rana Mbeling Village, 8°40'19.35"S, 120°43'0.37"E, 1,145 m asl., 9 September 2022, near a water spring, *Elizabeth A. Widjaja & Isti Larasati EAW 10150b* (BO!); East Nusa Tenggara, Manggarai, Reok Barat Subdistrict, Loce Village, Tagol Subvillage, 8°22'42.92"S, 120°23'30.35"E, 768 m asl., 20 December 2022, leaning to other trees, *Alifiah Bilqis Ramadhani s.n.* (BO!); East Nusa Tenggara, West Manggarai, Sano Nggoang Subdistrict, Nunang Village, 8°43'24"S, 120°00'12"E, 800 m asl., 16 January 1976 (written as 15 January 1976 at L), sapling specimen, *P. Erwin Schmutz 3853* (BO!, L!); East Nusa Tenggara, West Manggarai, Sano Nggoang Subdistrict, Sesok, 8°43'14"S, 120°02'06"E, 600 m asl., 25 January 1976 (written as 5 February 1976 at L) in flower, growing in the forest between ascending tree, *P. Erwin Schmutz 3866* (BO!, L!); East Nusa Tenggara, West Manggarai, Nunang, Todong Rancang Village, 8°43'24"S, 120°00'11"E, 850 m asl., 18 November 1971, in flowering, *P. Erwin Schmutz 2789* (BO!-holotype of *N. schmutzii*); East Nusa Tenggara, Manggarai, 10 Jan. 1978, *P. Erwin Schmutz 4208* (L!); East Nusa Tenggara, Manggarai, Nunang, 8°43'24"S, 120°00'12"E, 800 m asl., 30 Feb. 1979, *P. Erwin Schmutz 4377* (L!); East Nusa Tenggara, West Manggarai, Sano Nggoang Subdistrict, Wae Sano Village, 8°42'31.78"S, 119°59'53.51"E, 676.5 m asl., 9 September 2022, around Nunang Lake, *Elizabeth A. Widjaja & Isti Larasati EAW 10166* (BO!); East Nusa Tenggara, Manggarai, Werak Subdistrict, Kampung Taal, 8°41'57"S, 119°59'42"E, 700 m asl., 20 January 1993, near the lake, *Elizabeth A. Widjaja EAW 6602* (BO!, L, K, US); Sumbawa, Sumbawa Besar, Batulante Subdistrict, Batu Dulang Village, Renik Forest, 8°36'123"S, 117°14'369"E, 1,083 m asl., 20 April 2015, in flowering, in the forest, *I Gede Tirta GT3496* (BO!); Sumbawa, Sumbawa Besar, KPH Batulante, Berang Hode, 8°35'613"S, 117°15'870"E, 707 m asl., 16 May 2016, in flowering, *LD Sulistyaningsih LDS 297* (BO!); Sumba, Mangiliwari (near Mao Marroe), 10°03'30"S, 120°17'41"E 600–800 m asl., 9 May 1925, in flowering, valley surrounding the savannah area, *Iboet 443* (BO!-Holotype of *N. reholtumianus*).

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