

BAMBOOS DIVERSITY IN BANGGAI KEPULAUAN, CENTRAL SULAWESI, INDONESIA

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Abstract. A bamboo inventory for Banggai Kepulauan has never been done. Knowledge of the islands' floristic diversity is poor. This study explored bamboo diversity in Banggai Kepulauan, Central Sulawesi, Indonesia. We conducted fieldwork from June – July 2019 on the islands of Peleng and Bakalan. Bamboo specimens were collected and deposited in Herbarium Bogoriense. We describe these specimens here. We found eight species: *Bambusa tuldoidea* Munro, *B. vulgaris* Schrad. ex Wendl., *Dendrocalamus asper* (Schult.f.) Backer ex Heyne, *Gigantochloa atter* (Hassk.) Kurz, *Neololeba atra* (Lindl.) Widjaja, *Schizostachyum brachycladum* (Kurz ex Munro) Kurz, *S. lima* (Blanco) Merr., and *Thyrsostachys siamensis* Gamble. Here we record information on morphology, habitat and distribution alongside photographs and an identification key to the bamboo species of Banggai Kepulauan.

Keywords: Bakalan, Bamboo, Banggai, diversity, identification key, Peleng

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INTRODUCTION

Banggai Kepulauan (often abbreviated to 'Bangkep') is a regency in Central Sulawesi Province, Indonesia. Banggai Kepulauan is an archipelago with 6671.32 km² of sea area and a total land area of 2488.79 km² (BPSKKB, 2018). The islands are south of the eastern peninsula of Sulawesi (1°6'30"S – 1°35'58"S and 122°37'6.3"E – 123°40'1.9"E), reaches 1000 m asl. The largest island is Peleng (BPLHKBK, 2009) covering 2325 km² area (Hasanah, 2017). Locally it is called "Peling". Publications and maps refer to "Peleng" (see Sody, 1949; Merker & Groves, 2006; Atmadilaga, 2008; Shekelle et al., 2008; KPU, 2012; Conle & Hennemann, 2018; Cumming & Teemsma, 2018; Boonmekam et al., 2019) as does the name of an endemic marsupial, *Tarsius*

pelengensis Sody (Sody, 1949; Shekelle et al., 2008). The official report of regional environmental status from the government of Banggai Kepulauan, refer to "Peleng" and "Peling" inconsistently (see BPLHKBK, 2009). Abbas (2017) mentioned the word "Peling" refers to the accent of the local people. "Peling" is also the local name for a bamboo, later identified as *Gigantochloa atter* (Hassk.) Kurz.

A bamboo inventory for Banggai Kepulauan has never been done. Knowledge of the islands' floristic diversity is poor. Until recently only two botanists have visited the Banggai Islands; D. W. Horst in 1899 and Kaudern in 1920, only 20 collections were made (Steenis-Kruseman, 1950). Rahmadi et al. (2014) later conducted an inventory of the flora and fauna. Only one species of bamboo was recorded from Peleng Island, namely *bambu*

pelung (*G. atter*). Ervianti et al. (2019) also reported that *G. atter* was found in Banggai Kepulauan. In 2019, the Research Center for Biology – LIPI explored the diversity of flora and fauna in Banggai Kepulauan. One of the aims of this research was to understand the diversity of bamboo and add to the information on Bamboo Diversity of Sulawesi, Indonesia written by Ervianti et al. (2019). This research can be used for future conservation management and for a bamboo industry that could be developed.

MATERIALS AND METHODS

Fieldwork took place on the islands of Peleng and Bakalan, Banggai Kepulauan (Figure 1) in June – July 2019. We visited the districts of Tinangkung, Tinangkung Utara, Tinangkung Selatan, Totikum Selatan, Liang, Peling Tengah, Bulagi, Bulagi Utara, and Buko. This study was conducted by using a method of collecting flora diversity by Rugayah et al. (2004). Bamboo herbarium specimens were collected using the

method of McClure (1945). Sterile bamboos were also collected (Janzen, 1976). Morphology, habitat, location, coordinates, altitude, and local name data were recorded. The information on uses was obtained from interviews with local communities. Photographs of specimens before drying were taken.

All of the specimens were sent to the Herbarium Bogoriense (BO) for further processing, following Djarwaningsih et al. (2002). The specimens were identified by matching with BO specimens and using related literature such as Dransfield (1992; 1996), Widjaja (1987; 1997; 2001a; 2001b; 2009), Dransfield & Widjaja (1995), Widjaja et al. (2004; 2005), Wong & Dransfield (2016), Damayanto & Widjaja (2016) and Ervianti et al. (2019). Herbarium abbreviation followed Girmansyah et al. (2006; 2018), while the accepted names of the species followed Vorontsova et al. (2016) and websites such as ipni.org (IPNI, 2020). An identification key to the species of Banggai Kepulauan and its distribution map are provided.

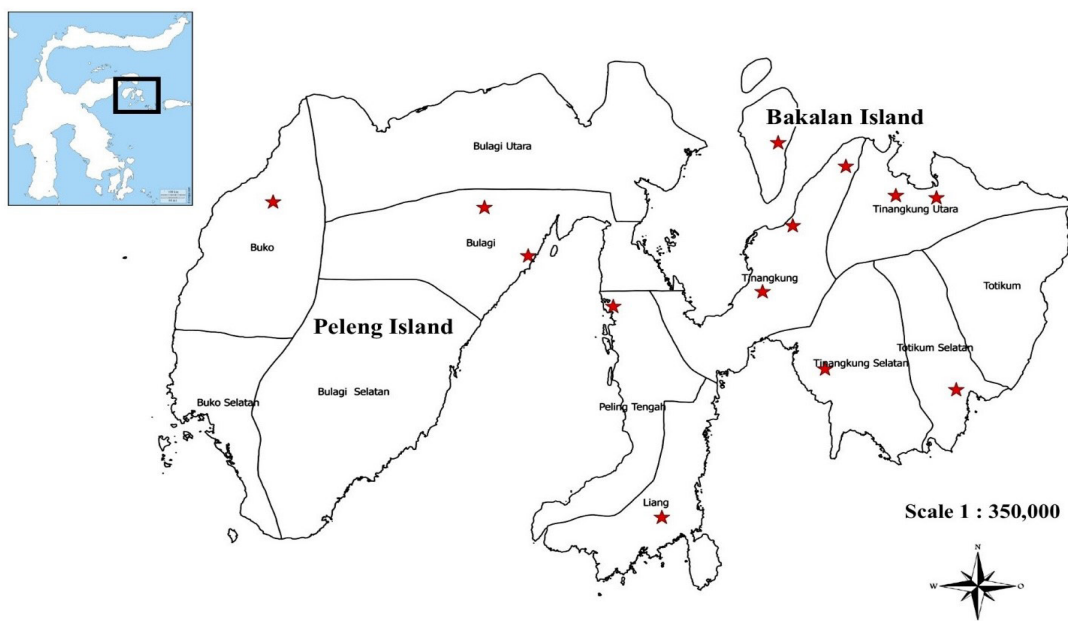


Figure 1. Research locations (red stars) on the islands of Peleng and Bakalan, Banggai Kepulauan Damayanto & Rahmawati

RESULTS AND DISCUSSION

Thirty-five bamboo collections were made from Banggai Kepulauan. From these collections, eight species have been identified; *Bambusa tuldoides* Munro, *B. vulgaris* Schrad. ex Wendl., *Dendrocalamus asper* (Schult.f.) Backer ex Heyne, *Gigantochloa atter* (Hassk.) Kurz, *Neololeba atra* (Lindl.) Widjaja, *Schizostachyum brachycladum* (Kurz ex Munro) Kurz, *S. lima* (Blanco) Merr. and *Thyrsostachys siamensis* Gamble.

All of the identified bamboos are found on mainland Sulawesi. There are 39 species of bamboo in Sulawesi overall belong to 12 genera (Ervianti et al., 2019). We, therefore, find greater than 20% of total Bamboo diversity on Sulawesi in Banggai Kepulauan and 50% of total genera. Peleng Island (2325 km²) (Hasanah, 2017), is less diverse (eight species and six genera) than other small islands (Figure 2). For instance, Selayar Islands, South Sulawesi, is smaller (1357.03 km²) (BPSKKS, 2018) but has eight species and four genera (Liana et al., 2017; 2018).

Bengkalis Island, Riau, is even smaller (0.938 km²) (processed from BPSKB, 2018) and has nine species and five genera (Rijaya & Fitmawati, 2019). In Bakalan Island alone, there was only one species of bamboo found, namely *B. vulgaris*. Some species of bamboos are very abundant in Peleng Island such as *B. vulgaris*, *G. atter*, *N. atra* and *S. lima*, whilst *D. asper*, is rare. *Neololeba atra* and *S. lima* grow wildly in the secondary forest and also cultivated in the garden. Bamboo distribution in Banggai Kepulauan is presented in Figure 3.

Most of the bamboo species in Banggai Kepulauan are used for building materials, water containers, sticks for picking cloves and to catch pests, a trellis for the cloves, for mats, as ornamentals and as a container for making traditional food, namely *nasi jaha* and *bambu suman*. This is similar to *nasi leman*, however, *nasi jaha* is made from *pulut* rice (a kind of sticky rice), while *bambu suman* is made from taro. Young shoots are also eaten.

An identification key and a synopsis of bamboos in Banggai Kepulauan are presented below.

Identification Key to the Bamboo Species of Banggai Kepulauan

1. a. Branches with several sub-equal slender branches.....2
- b. Branches with a dominant primary branch and several smaller branches.....3
2. a. Young shoots green; culm internodes 100-150 cm long; culm-sheaths auricles inconspicuous, blade narrow linear-lanceolate and deflexed.....*Schizostachyum lima*
- b. Young shoots yellowish green; culm internodes 30-50 cm long; culm-sheaths auricles small, blade broadly triangular and erect.....*Schizostachyum brachycladum*
3. a. Culms less than 8 m high with inflated internodes (when in the pot or dry areas); culm-sheaths apex asymmetrically arched.....*Bambusa tuldoides*
- b. Culms more than 8 m high without inflated internodes; culm-sheaths apex usually symmetrically arched.....4
4. a. Culms 8-12 m high, diameter up to 5 cm.....5
- b. Culms 15-20 m high, diameter more than 5 cm.....6
5. a. Culms 8-12 m high, walls 3-4 mm thick, internodes 30-80 cm long; young shoots green to purplish-green, covered with white or light brown to brown hairs; culm-sheath auricles rounded with bristles up to 10 mm long, ligule irregular with bristles up to 8 mm long.....*Neololeba atra*
- b. Culms up to 8 m high, walls 4-5 mm thick, internodes up to 30 cm long; young shoots pale

- green and glabrous; culm-sheath auricles inconspicuous and glabrous, ligule entire and glabrous.....*Thyrsostachys siamensis*
6. a. Young shoots yellow or yellowish-green covered with brown to black hairs; culm slightly zigzag; culm-sheath blade broadly triangular and erect.....*Bambusa vulgaris*
- b. Young shoots purplish-black covered with velvety brown to blackish hairs or green to purplish covered with black hairs; culm straight; culm-sheath blade narrow triangular and deflexed...7
7. a. Young shoots purplish-black, covered with velvety brown to blackish hairs; young culm covered with velvety greenish or golden-brown appressed hairs at the lower part; culm-sheath auricles rounded and sometimes curly.....*Dendrocalamus asper*
- b. Young shoots green to purplish, covered with black hair; young culm covered with scattered black hairs; culm-sheath auricles rounded or rounded with curved outward.....*Gigantochloa atter*

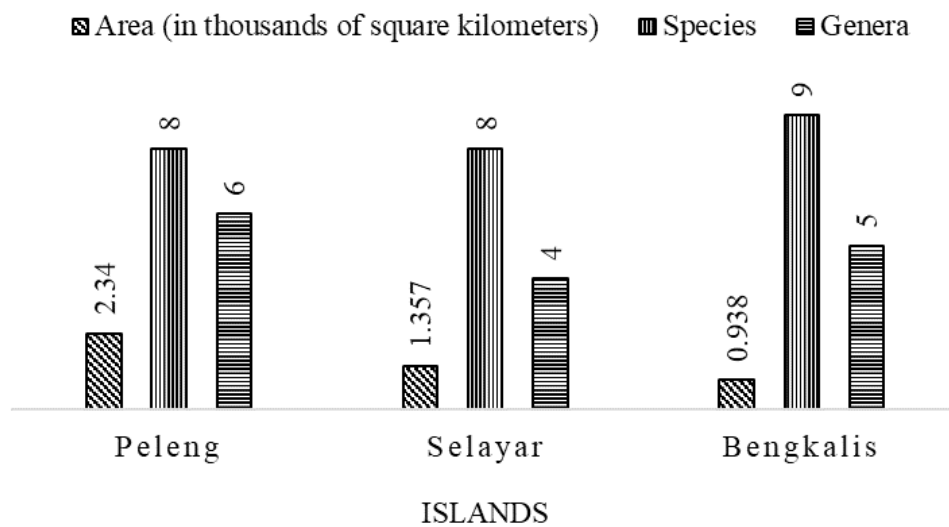


Figure 2. Comparison of bamboo species in several small islands in Indonesia

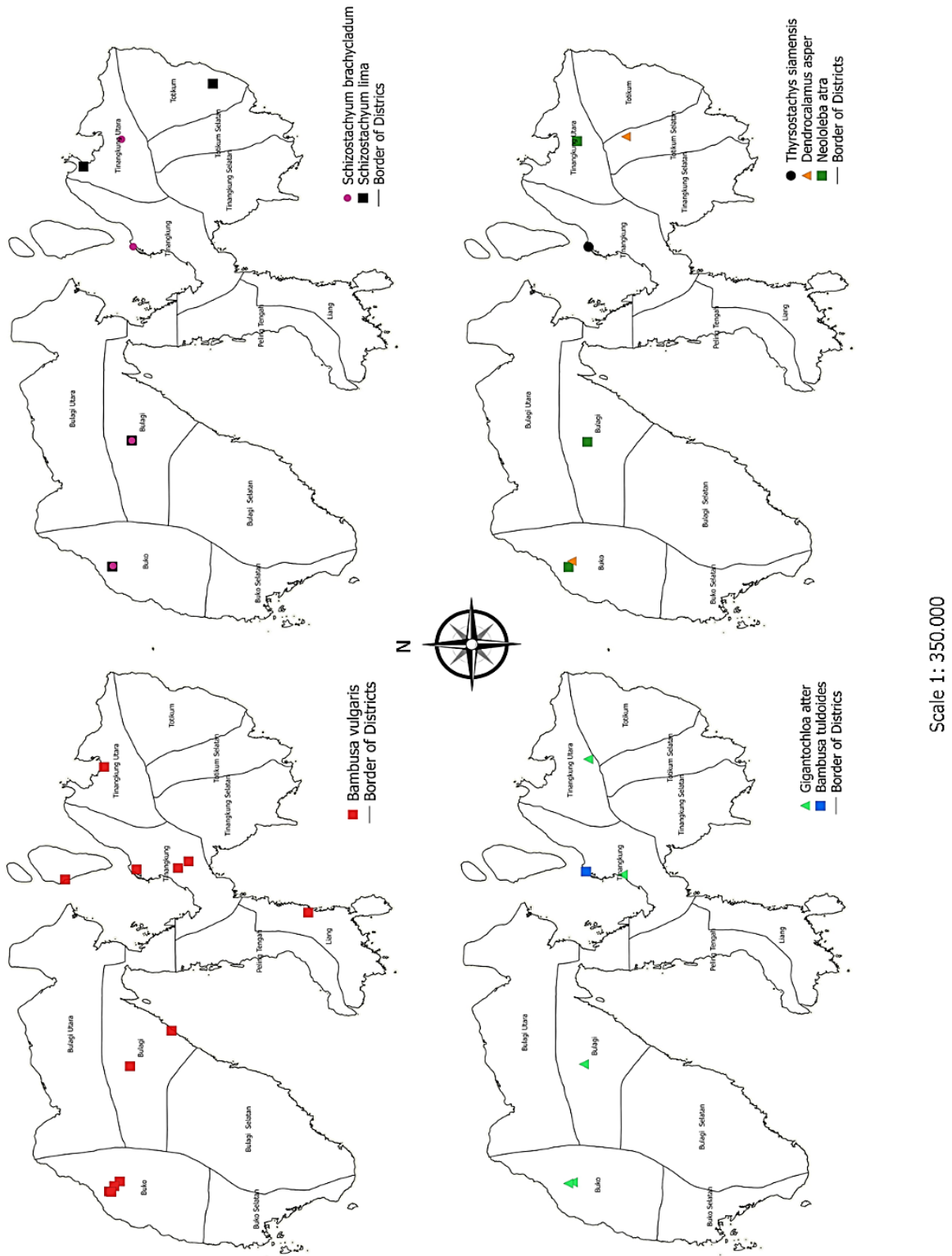


Figure 3. Bamboo distribution in Banggai Kepulauan

A Synopsis of Bamboos from Banggai Kepulauan

Bambusa tuldoides Munro, Trans. Linn. Soc. London 26: 93 (1868).

Description

Young shoots green, glabrous or covered with brown to black hairs. Culms 3-4 m high (sometimes up to 10 m high in wet areas or nutrient-rich soil), erect, green, internodes 7-10 cm long and inflated (when in the pot or dry areas), 5-7 cm in diameter. Branches with a dominant and several smaller branches. Culm-sheaths 12.5-14.5 cm long × 12-13.5 cm wide, deciduous, glabrous, apex asymmetrically arched; auricles prominent up to 3 m high, bristles up to 5 mm long; ligule 1-2 mm high, densely fringed, glabrous; blade 2.5-3 cm long × 2.8-3 cm wide, triangular, erect. Leaves 10-13 cm long × 1-2 cm wide, green; auricles small or inconspicuous, 1-1.5 mm high, bristles up to 6 mm long; ligule entire, glabrous (Figure 4a).

Habitat and Distribution

Cultivated at an altitude of 4 m. This bamboo can be found only in Salakan, Tinangkung District in Peleng Island.

Vernacular Name

The vernacular name of this bamboo in Banggai Kepulauan is unknown. In Indonesia, this bamboo is known as *bambu blenduk* (But & Chia, 1995; Ervianti et al., 2019).

Uses

This bamboo is used as an ornamental plant in Banggai Kepulauan.

Notes

The rhizome of this bamboo has been brought from the mainland of Sulawesi. This species is a native of southern China and Vietnam (But & Chia, 1995) and has been introduced to Indonesia. Widjaja (2001a) mentioned the inflated internodes of this bamboo when cultivated in the pot or in dry areas. Internodes are not inflated when this bamboo is

cultivated in wet areas or on nutrient-rich soil.

Specimen Examined

Central Sulawesi, Banggai Kepulauan, Peleng Island: Tinangkung District, Salakan, along the road KRI Tengiri, 1°18'35.0"S 123°17'24.6"E, 4 m asl., 29 June 2019, I.P.G.P. *Damayanto 819* (BO).

Bambusa vulgaris Schrad. ex Wendl., Coll. Pl. 2: 26 (1808).

Description

Young shoots yellowish-green or yellow, covered with brown to black hairs. Culms slightly zigzag, erect, 10-20 m high, green or yellow with green stripes, internodes 20-35 cm long, 10-17 cm in diameter. Branches with a dominant primary and several smaller branches. Culm-sheaths 25-35 cm long × 26-43 cm wide, deciduous, covered with dark brown to black hairs; auricles rounded and curved outward up to 1-1.2 cm high, bristles up to 1 cm long; ligule toothed, 3-5 mm high with short bristles; blade 6-14 cm long × 8-10 cm wide, erect, broadly triangular. Leaves 20-25 cm long × 2.5-3 cm wide, green; auricles less than 1 mm high with few bristles or glabrous; ligule entire or sub-entire, less than 1 mm high, glabrous (Figure 4b-c).

Habitat and Distribution

Cultivated along the roads, in gardens and found in the secondary forest, and in an open area of a village at an altitude of 5-800 m. This bamboo is very abundant and commonly found on the islands of Peleng and Bakalan.

Vernacular Name

The vernacular name of this bamboo is *aok tuu* (Tinangkung, Tinangkung Utara and Buko).

Uses

This species is used as a mat, a trellis for cloves, for building materials, and sometimes for making *bambu suman* in the dry season at Alul Village. The young shoot is used as a

vegetable but bitterer than *D. asper*.

Notes

There are three varieties of *B. vulgaris* can be found in Indonesia, namely *B. vulgaris* var. *vulgaris* (green culm), var. *striata* (=vita-ta) (yellow culm with green stripes), and var. *wamin* (green culm with inflated internodes) (Widjaja, 2001a). Only var. *vulgaris* (Figure 4b) and var. *striata* (Figure 4c) are found in Banggai Kepulauan. The variety *vulgaris* is more abundant than var. *striata* in Banggai Kepulauan. The variety *striata* is found in the southern part of Bulagi District or in Bulagi Selatan District.

Specimens Examined

Central Sulawesi, Banggai Kepulauan; Bakalan Island: Tinangkung District, near Bulungkobit Village, 1°13'20.1"S 123°16'51.6"E, 5-10 m asl., 8 July 2019, *I.P.G.P. Damayanto & A. Haryadi 953* (BO). Peleng Island: Tinangkung District, along the road near Saiyong to the Gansal Village, 1°23'03.0"S 123°18'19.0"E, 105 m asl., 29 June 2019, *I.P.G.P. Damayanto 794* (BO); ibidem, 1°22'10.2"S 123°17'46.6"E, 226 m asl., 29 June 2019, *I.P.G.P. Damayanto 814* (BO); Tinangkung District, Salakan, along the road to Bukit Trikora, 1°18'55.6"S 123°17'40.1"E, 90 m asl., 29 June 2019, *I.P.G.P. Damayanto 817* (BO); Tinangkung Utara District, Luk Sagu Village, 1°16'23.0"S 123°25'55.4"E, 100-200 m asl., 30 June 2019, *I.P.G.P. Damayanto 829* (BO); Buko District, Leme-leme Darat Village, Kokolomboy Sub-Village, Taman Kehati, 1°16'46.4"S 122°51'44.0"E, 300-570 m asl., 1 July 2019, *I.P.G.P. Damayanto 846* (BO); ibidem, 1°17'36.79"S 122°52'32.48"E, 700-800 m asl., 3 July 2019, *I.P.G.P. Damayanto 880* (BO); ibidem, 1°17'11.0"S 122°52'10.0"E, 500 m asl., 4 July 2019, *I.P.G.P. Damayanto & A. Haryadi 896* (BO); ibidem, 1°16'56.3"S 122°51'41.6"E, 500 m asl., 5 July 2019, *I.P.G.P. Damayan-*

to & A. Haryadi 936 (BO); Bulagi District, Tolo Village, 1°21'40.0"S 123°04'41.0"E, 20 m asl., 6 July 2019, *I.P.G.P. Damayanto, D. Sulistiarini, F.I. Windadri, D. Sahroni & D. Surya 951* (BO); Liang District, 50 m from Pentu Cave, 1°32'22.0"S 123°14'12.0"E, 33 m asl., 2 July 2019, *I.P.G.P. Damayanto, D. Sulistiarini, F.I. Windadri, D. Sahroni & D. Surya 952* (BO); Bulagi District, Alul Village, 1°18'25.0"S 123°01'49.0"E, 200-300 m asl., 9 July 2019, *I.P.G.P. Damayanto, A. Haryadi & I. Sumanta 960* (BO).

***Dendrocalamus asper* (Schult.f.) Backer ex Heyne**, Nutt. Pl. Ned.-Ind. 2(1): 301 (1927).

Description

Young shoots purplish-black to black, covered with velvety brown to black hairs. Culms 25-30 m high, erect, green or dark green or purplish-green or greyish-green, when young covered with velvety golden-brown appressed hairs and later glabrous, internodes 25-30 cm long with the aerial root at the lower part, 15-20 cm in diameter. Branches with a dominant primary branch and several smaller branches. Culm-sheaths 40-48 cm long × 30-35 cm wide, deciduous, covered with velvety dark brown to black hairs; auricles up to 6.5 mm high, prominent and crimped, bristles up to 5 mm long; ligule 5-10 mm high, irregularly toothed with short bristles up to 3 mm long; blade 15-28 cm long × 2-3 cm wide, lanceolate, erect first and later deflexed. Leaves 20-33 cm long × 2.5-4 cm wide, green; auricles small or absent and glabrous; ligule entire and short, glabrous (Figure 4d).

Habitat and Distribution

Cultivated on river-banks and in gardens near the secondary forest at an altitude of 100-500 m. This bamboo is relatively rare in Banggai Kepulauan. So far, *D. asper* is only found in Bangpanga Village, Tinangkung Utara District and near Kokolomboy Sub-Vil-

lage, Leme-leme Darat Village, Buko District.

Vernacular Name

The vernacular name of this bamboo is *pontung* (Tinangkung Utara; Buko).

Uses

In Banggai Kepulauan, culm of *D. asper* is used as a building material, the young shoots are used as a vegetable.

Specimens Examined

Central Sulawesi, Banggai Kepulauan, Peleng Island: Tinangkung Utara District, Bangpanga Village, 1°18'45.0"S 123°26'30.5"E, 100-200 m asl., 30 June 2019, *I.P.G.P. Damayanto* 830 (BO); Buko District, Leme-leme Darat Village, near Kokolomboy Sub-Village, Taman Kehati, 1°17'11.0"S 122°52'10.0"E, 500 m asl., 4 July 2019, *I.P.G.P. Damayanto & A. Haryadi* 897 (BO).

***Gigantochloa atter* (Hassk.) Kurz**, Nat. Tijdschr. Ned. Ind. 27: 226 (1864).

Description

Young shoots green or purplish-green, covered with black hairs. Culms 15-20 m high, erect, bluish-green to dark green, covered with scattered black hairs when young, becoming glabrous when mature, internodes 20-40 cm long, 10-15 cm in diameter. Branches with a dominant primary branch and several smaller branches. Culm-sheaths 23-26 cm long × 28-32 cm wide, deciduous, covered with dark brown to black hairs; auricles rounded or rounded with curved outward, easily broken when dry, 0.5-1 cm high, bristles up to 5 mm long and easily broken; ligule toothed, up to 0.5 cm high and glabrous; blade lanceolate, 4.5-5.5 cm long × 2.5-3 cm wide, easily fall, deflexed. Leaves 20-30 cm long × 3-5 cm wide, green; auricles small, less than 1 mm high and glabrous; ligule entire, up to 1 mm high and glabrous (Figure 4e).

Habitat and Distribution

Cultivated along the roads, in gardens,

and found in the secondary forest or forest border at an altitude of 92.4-739 m. This bamboo is very abundant and is widespread on Peleng Island.

Vernacular Name

The vernacular name of this bamboo is *peling* (Tinangkung, Tinangkung Utara, Tinangkung Selatan, Liang, Peling Tengah, Bulagi, Bulagi Utara and Buko).

Uses

The culm of this bamboo is used as a building material for the floor or walls of stilts house and especially for the central pillar of the traditional roof (called *ato* and the thatch made from sago leaves). Young shoots are eaten.

Specimens Examined

Central Sulawesi, Banggai Kepulauan, Peleng Island: Bulagi Utara District, Teluk Panentera, 16 September 2014, *D. Girman-syah* 1902 (BO); Tinangkung District, three-way junction of Saiyong-Gansal-Salakan, 1°21'27.0"S 123°17'09.0"E, 92.4 m asl., 29 June 2019, *I.P.G.P. Damayanto & D. Sahrani* 816 (BO); Tinangkung Utara District, Bangpanga Village, 1°18'45.0"S 123°26'30.5"E, 100-200 m asl., 30 June 2019, *I.P.G.P. Damayanto* 831 (BO); Buko District, Leme-leme Darat Village, near Kokolomboy Sub-Village, Taman Kehati, 1°17'32.5"S 122°52'15.7"E, 739 m asl., 3 July 2019, *I.P.G.P. Damayanto & A. Haryadi* 888 (BO); *ibidem*, 1°17'11.0"S 122°52'10.0"E, 500 m asl., 4 July 2019, *I.P.G.P. Damayanto* 895 (BO); Bulagi District, Alul Village, 1°18'25.0"S 123°01'49.0"E, 200-300 m asl., 9 July 2019, *I.P.G.P. Damayanto, A. Haryadi & I. Sumanta* 964 (BO).

***Neololeba atra* (Lindl.) Widjaja**, Reinwardtia 11(2): 114 (1997).

Description

Young shoots green to purplish green covered with white to brown hairs. Culms 5-7 m high, erect, green, internodes 50-100

cm long, 3-4 cm in diameter. Branches with a dominant branch and 1-2 smaller branches, branching only in the upper part. Culm-sheath 17-26 cm long × 14-15 cm wide, persistent, covered with white or brown hairs; auricles rounded up to 6 mm high with long bristles 4-8 mm long; ligule dentate irregular up to 6 mm high with bristles up to 6 mm long; blade 6.5-14.5 cm long × 3.5-5 cm wide, erect, triangular with a cordate base. Leaves 23-37 cm long × 6-10 cm wide, green; auricles rounded up to 1-1.5 mm high with long bristles up to 2 cm long; ligule lacinate 1-2 mm high, bristles up to 1.5 cm long (Figure 4f).

Habitat and Distribution

Cultivated in gardens, along the roads and grows wild in the border of the secondary forest and along riverbanks at an altitude of 10-500 m. This bamboo is abundant in Leme-leme Darat Village, Buko District; Alul Village, Bulagi District; and Bangpanga Village, Tinangkung Utara District. This species is also abundant along the road near Patukuki Village, Peling Tengah District.

Vernacular Name

The vernacular name of this bamboo is *lonas* (Tinangkung Utara; Buko; Bulagi).

Uses

This bamboo is used as a rope to tie an *ato* (traditional roof).

Notes

This species can produce a new clump when the mature culm falls to the ground. This bamboo has two forms, plants with green culm and plants with purplish-green culm (Widjaja, 1995; 1997). Only the green culm is found in Banggai Kepulauan.

Specimens Examined

Central Sulawesi, Banggai Kepulauan, Peleng Island: Tinangkung Utara District, Bangpanga Village, 1°17'36.0"S 123°26'08.8"E, 100-200 m asl., 30 June 2019, *I.P.G.P. Damayanto* 827 (BO); Buko Dis-

trict, Leme-leme Darat Village, Kokolomboy Sub-Village, Taman Kehati, 1°16'56.3"S 122°51'41.6"E, 500 m asl., 5 July 2019, *I.P.G.P. Damayanto* & *A. Haryadi* 935 (BO) and 937 (BO); Bulagi District, Alul Village, 1°18'25.0"S 123°01'49.0"E, 200-300 m asl., 9 July 2019, *I.P.G.P. Damayanto*, *A. Haryadi* & *I. Sumanta* 959 (BO).

***Schizostachyum brachycladum* (Kurz ex Munro) Kurz**, *J. Asiat. Soc. Bengal*, Pt. 2, Nat. Hist. 39: 89 (1870).

Description

Young shoots yellow or yellowish-green, covered with brown hairs. Culms 8-9 m high, erect, green or yellow with green stripes, internodes 25-30 cm long, 5-6 cm in diameter. Branches with several sub-equal slender branches. Culm-sheaths 17-18 cm long × 17-18 cm wide, not easily fall, covered with light brown to brown hairs; auricles small, 0.5-1 cm high, bristles up to 5 mm long; ligule entire, 1-2 mm high and glabrous; blade broadly triangular, 4.5-5.5 cm long × 5-5.5 cm wide, erect. Leaves 25-30 cm long × 5-5.5 cm wide, green; auricles small, less than 1 mm high, bristles up to 10 mm long; ligule entire, up to 1 mm high and glabrous (Figure 4g-h).

Habitat and Distribution

Cultivated in gardens, along the roads, and found in the border of the secondary forest at an altitude of 4-500 m. This bamboo is only found in Districts of Tinangkung, Tinangkung Utara, Bulagi, and Buko. The green culm is found in the village and the garden, while the yellow culm with green stripes is found in city areas.

Vernacular Name

The vernacular names of this bamboo are *lamayu* (Tinangkung Utara; Buko) or *lemayu* (Bulagi).

Uses

This bamboo is used as a stick for pick-

ing fruit, a container for making *nasi jaha* and *bambu suman* and the yellow culm with green stripes is used as an ornamental plant.

Notes

This species flowers every year. According to Widjaja (2001b), *S. brachycladum* has two “varieties”: the green culm (Figure 4g) and the yellow culm with green stripes (Figure 4h). These “varieties” have not been given a taxonomic name (Dransfield, 1995).

Specimens Examined

Central Sulawesi, Banggai Kepulauan, Peleng Island: Tinangkung District, Salakan, along the road Hassanudin, 1°18'31.2"S 123°17'28.6"E, 4 m asl., 29 June 2019, *I.P.G.P. Damayanto 818* (BO); Tinangkung Utara District, Bangpanga Village, 1°17'36.0"S 123°26'08.8"E, 100-200 m asl., 30 June 2019, *I.P.G.P. Damayanto 828* (BO); Buko District, Leme-leme Darat Village, near Kokolomboy Sub-Village, Taman Kehati, 1°16'56.3"S 122°51'41.6"E, 500 m asl., 5 July 2019, *I.P.G.P. Damayanto & A. Haryadi 938* (BO); Bulagi District, Alul Village, 1°18'25.0"S 123°01'49.0"E, 200-300 m asl., 9 July 2019, *I.P.G.P. Damayanto, A. Haryadi & I. Sumanta 961* (BO) and *962* (BO).

Schizostachyum lima (Blanco) Merr., Amer. J. Bot. 3(2): 62 (1916).

Description

Young shoots green, covered with light brown hairs. Culms 4-8 m high, erect, green, internodes 60-150 cm long, up to 3 cm in diameter. Branches with several subequal slender branches. Culm-sheaths 20-30 cm long × 6-8 cm wide, covered with brown to dark brown hairs; auricles inconspicuous with bristles up to 1 cm long; ligule entire or irregularly toothed with short bristles; blade narrowly linear, 19-30 cm long × 0.5-1 cm wide, deflexed, easily fall when mature. Leaves 18-24 cm long × 3.5-4 cm wide,

green; auricles short with bristles 0.5-1 cm long; ligule irregularly toothed (Figure 4i).

Habitat and Distribution

Cultivated along the roads, in gardens and grows wild in the border of the secondary forest at an altitude of 5-400 m. This bamboo is relatively abundant in Districts of Tinangkung Utara, Bulagi and Totikum Selatan in Peleng Island.

Vernacular Name

The vernacular names of this bamboo are *toi* (Tinangkung; Tinangkung Utara), *lambangan* (Tinangkung) or *lambanan* (Bulagi).

Uses

This bamboo is used as a stick to catch pests with the tip filled with sticky sap.

Notes

This bamboo is common in the eastern part of Indonesia, such as Sulawesi, Maluku and Papua (Roxas & Dransfield, 1995).

Specimens Examined

Central Sulawesi, Banggai Kepulauan, Peleng Island: Tinangkung Utara District, along the road from Lalong to Bangpanga Village, 1°14'37.1"S 123°23'56.4"E, 22 m asl., 30 June 2019, *I.P.G.P. Damayanto & A. Haryadi 826* (BO); Totikum Selatan District, Kalumbatan Village, 1°24'46.5"S 123°30'38.0"E, 5 m asl., 30 June 2019, *I.P.G.P. Damayanto & S.K. Senjaya 833* (BO); Buko District, Leme-leme Darat Village, near Kokolomboy Sub-Village, Taman Kehati, 1°16'53.1"S 122°51'38.2"E, 400 m asl., 7 July 2019, *I.P.G.P. Damayanto 950* (BO); Bulagi District, Alul Village, 1°18'25.0"S 123°01'49.0"E, 200-300 m asl., 9 July 2019, *I.P.G.P. Damayanto, A. Haryadi & I. Sumanta 963* (BO).

Thyrsostachys siamensis Gamble, Ann. Roy. Bot. Gard. (Calcutta) 7: 59 (1896).

Description

Young shoots pale green to purplish-green, glabrous. Culms 4-7 m high,

erect, pale green to greyish green, covered with persistent old culm-sheaths, internodes up to 20-25 cm long, 4-5 cm in diameter. Branch with a dominant primary branch and several smaller branches. Culm-sheaths persistent, 20-22 cm long \times 6-10 cm wide, covered with white hairs; auricles inconspicuous or very small; ligule entire and glabrous; blade narrowly triangular, erect, easily fall when mature. Leaves 10-17 cm long \times 0.5-1.4 cm wide, pale green; auricles very small or inconspicuous and glabrous; ligule entire and glabrous (Figure 4j).

Habitat and Distribution

Cultivated along the roads and outside homes at an altitude of 4 m. So far, this bamboo was only found in Tinangkung District at Peleng Island.

Vernacular Name

The vernacular name of this bamboo is unknown. In Indonesia, this bamboo was called *bambu jepang* or *bambu bangkok* (Wi-

djaja, 2001a).

Uses

This bamboo is used as an ornamental.

Notes

This species has been introduced to Indonesia from Thailand (Widjaja, 2001a).

Specimens Examined

Central Sulawesi, Banggai Kepulauan, Peleng Island: Tinangkung District, Salakan, along the road Trisula, 1°18'30.2"S 123°17'36.5"E, 4 m asl., 29 June 2019, *I.P.G.P. Damayanto* 820 (BO); Tinangkung District, Salakan, along the road KRI Hassanudin, 1°18'30.9"S 123°17'34.8"E, 4 m asl., 29 June 2019, *I.P.G.P. Damayanto* 821 (BO).

From this research, it can be concluded, there are eight species of bamboo found in Banggai Kepulauan, Sulawesi: *Bambusa tuldooides*, *B. vulgaris*, *Dendrocalamus asper*, *Gigantochloa atter*, *Neololeba atra*, *Schizostachyum brachycladum*, *S. lima* and *Thyrsostachys siamensis*.



Figure 4. *Bambusa tuldooides* (a); *B. vulgaris* var. *vulgaris* (b); *B. vulgaris* var. *striata* (c); *Dendrocalamus asper* (d); *Gigantochloa atter* (e); *Neololeba atra* (f); *Schizostachyum brachycladum* "green culm" (g); *S. brachycladum* "yellow with green stripes culm" (h); *S. lima* (i); *Thyrsostachys siamensis* (j) (Photos: I Putu Gede P. Damayanto)

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