

## Study on The Structure and Uses of Some Species of Sub-Family Bambusoideae in Yangon Region

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### Abstract

Bamboo is a tribe of perennial evergreen plants in the grass family Poaceae, in the subfamily Bambusoideae, and in the tribe Bambuseae. Fifteen species of bamboos in Yangon area were collected, studied, identified and classified. The study area is 3,927 square miles, and located between 16 09' East (10.8, 96.15) at an elevation of 0.30 meters above sea level. The study areas included Ahlone, Bahan, Insein, Kamayut, Mayangone, Mhawbi, Mingalardon, North Dagon and TaikKy. The specimen are studied, identified and classified according to Gamble (1896), Dransfield and Widjaja (1995), Wong (1995), Bamboo Phylogeny Group [BPG] (2012), Liese and Kohl (2013) and Clark *et al.* (2015) that was based upon the morphological characters. The habits, leaves, branches, and culm sheath are presented with photographs. The collected specimens were documented by making herbarium sheets and deposited at the Department of Botany, Dagon University.

### Introduction

Bamboos are a group of woody perennial evergreen plants from the true grass family Poaceae and belong to the group angiosperms and the order monocotyledon. There are 111 genera with approximately 1575 bamboo species over the world (Schroder, 2009). Myanmar has 14 genera and 96 species (Hundley and Chit KoKo, 1987), and 17 genera, about 100 species and 4 varieties of bamboo (NyunHtun, 2005).

Bamboos occur in the tropical, subtropical and temperate regions of all continents except Europe and Western Asia, from low lands up to 4000 m altitude (Dransfield and Widjaja, 1995). Being one of the fastest growing plants on earth, its growth rate ranges from 30 cm to 1m in 24 hours. The size of bamboo varies from small annuals to giant timber bamboo.

In this research, bamboos from seven areas of Yangon Region were collected, identified, classified and their uses were studied. The area of Yangon Region is about 3,927 square mile and located between 17.1025°N let, and 96.1527°E long, at an elevation of 0.30 meters above sea level. Yangon has a tropical monsoonal climate. Bamboo is a very useful material for human. From a plant to material, man has to restructure the bamboo's own natural structure into numerous objects to meet his needs in every life. Bamboos are economically important for building materials as well as food to paper (Yu, 2007).

They often have a tree-like habit and can be characterized as having woody, usually hollow culms, complex rhizome and branch systems, petiolate leaf blades with prominent sheathing organs and cycling of flowering. Among bamboo species, the vegetative growth varies from 1 to as much as 120 years and some species has never been known to flower (Ramachandran *et al.*, 2007). Because of the long time period before flowering in woody bamboos, vegetative characters such as culm sheath, ligule, blade, branching and leaves are often been used to classify these species instead of flowers.

Bambusoideae are grouped into three tribes Arundinaneae, Bambuseae and Olyreae. Tribe Bambuseae comprises the Neotropical and Paleotropical woody bamboos, widespread in both the Old World and New World (BPG,2012). The present work aimed to verify the identification and classification of the bamboos collected in

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Yangon Region, to contribute partial taxonomic information of Bambusoideae and to record the uses of bamboo plants in Yangon Region.

### Materials and Methods

In this research, bamboos were collected from Ahlone, Bahan, Insein, Kamayut, Mayangone, Mhawbi, Mingalardon, North Dagon and TaikKyí Township. The collected fresh specimens were described, after which references of William (1966), Soderstrom and Young (1983), Wong (1994), Dransfield and Widjaja (1995), Gamble (1996), Seethalakasmiet *al.* (1998), Schroder (2009), Bamboo phylogeny group [BPG] (2012), Liese and Kohl (2013) and Clark *et al.* (2015)

In bamboos only vegetative parts were studied and identified, because bamboos flowers only once in life time. Uses of bamboos were recorded from literature as well as by interviewing people from bamboo trade.

### Results

Fifteen species are collected and classified according to Bamboo Phylogeny Group, 2012. Based on the specimens collected for the present study from October, 2016 to February, 2017, (15) species collected could be assigned to the (8) genera of (2) subtribes such as Bambusinae and Melocanninae as follow. The scientific names are arranged alphabetically within each subtribe.

Subfamily	Tribe	Subtribes	Scientific Names
Bambusoideae	Bambuseae	1. Bambusinae	1. <i>Bambusa bambos</i> (L.) Voss
			2. <i>Bambusa nutans</i> Wall.
			3. <i>Bambusa tulda</i> Roxb.
			4. <i>Bambusa vulgaris</i> Schrad. Ex Wendl.
			5. <i>Bambusawamin</i> A. Camus,
			6. <i>Dendrocalamus giganteus</i> Munro.
			7. <i>Dendrocalamus lactiflorus</i> Munro.
			8. <i>Dendrocalamus longispatus</i> Kurz,
			9. <i>Dinochloa maccllellandii</i> (Munro) Kurz
			10. <i>Gigantochloa atroviolacea</i> Widjaja
			11. <i>Gigantochloa macrostachya</i> Kurz
			12. <i>Thyrsostachys siamensis</i> Gamble.
		2. Melocanninae	13. <i>Cephalostachyum pergracile</i> Munro
			14. <i>Melanocan nabaccifera</i> (Roxb.) Kurz
			15. <i>Schizostachyum brachycladum</i> Wall.

### Description of the Species

#### 1. *Bambusa bambos* (L.) Voss. Vilm. Blumengartn. ed. 3. 1:1189 (1895)

Culm is very densely tufted, sympodial, erect and arching at the tip. Nodes solitary, slightly swollen, single nodal line present, each node of lower culm with short aerial roots or root thorns. Internodes glabrous, sulcate in cross-section with very

thick wall, powdered on inside wall. Branches arising from nearly all nodes, the lower branches spreading horizontally forming densely interlaced thicket, bearing stout straight or curved spines, spines usually in groups of three; the upper branches ascending, the central one usually larger and longer than the others. Culm sheath brown in color, tip rounded, wrinkled, both surfaces glabrous, the margin plaited, soft, deciduous; ligule present, fringed with white cilia; auricles are not prominent; culm blade much shorter than the sheath, triangular, base cordate, tip acute, erect, glabrescent abaxially, adaxially surface with dense brown appressed hairs, margin ciliate, persistent. Foliage leaves 9-11; leaf sheath broad, pubescent; ligule membranous, pubescent; auricles small, bearing a few bristles; leaf blade linear-lanceolate, leaf base slightly rounded, apex acuminate, surfaces glabrous, margin scabrous, midrib conspicuous with lateral veins.

**2. *Bambusa nutans* Wall. ex Munro Trans. Linn. Soc. London 26:29 (1868)**

A medium sized graceful bamboo, tufted, sympodial. Culm erect and straight. Nodes solitary, distinctly prominent swollen, single nodal line present, white ring below the nodes, and nearly all nodes with aerial rootlets. Internodes uniformly white pubescent at first becoming smooth, not shining, rounded in cross section, hollow with thick wall, powdered on inside wall, greyish green. Branches produced at nodal line, much branched above usually unbranched below, 1-3 branches, complement of dominant primary branch with secondary and tertiary orders, angled upward. Culm sheath pale-brown in color, cylindrical, the abaxial surface covered with scattered black hairs when mature becoming glabrous, the adaxial surface glabrous, margin entire, soft, deciduous; ligule membranous, margin serrate; auricles present, wavy equal in each side, fringed with long curved bristles; culm blade broadly ovate, erect with acuminate apex, both surfaces finely pubescent, both margins have long bristles especially near the base, persistent. Foliage leaves 8 -10; leaf sheath glabrous, striate; ligule membranous, margin entire; auricles small with few bristles; leaf blade linear-lanceolate, leaf base attenuate, apex acuminate, both surface glabrous, margins serrate, midrib conspicuous with lateral veins.

**3. *Bambusa tulda* Roxb. Fl. Ind. ed. 1832, 2:193 (1832)**

Densely tufted, sympodial bamboo. Culm erect with arching over. Nodes solitary, single nodal line present, pubescent, white ring below and above the node, lower nodes with aerial roots. Internodes pubescent on the surface, rounded in cross section with thick wall, powdered on inside wall, green when young and greyish-green on maturity. Branches produced at nodal line, arising from lower parts of culm, about 1-7 branches, dominant primary branch with secondary and tertiary orders without spines, angled upward. Culm sheath pale brown in color, triangular in shape, dark brown appressed hairs on the abaxial surface, the adaxial surface glabrous, ciliate at both margin, hard, deciduous; ligule present, margin entire; auricles unequal, broad and tall with ciliate; culm blade broadly triangular reniform or cordate in shape, erect, the apex acute, both surfaces covered with short scattered dark brown hairs, persistent. Foliage leaves 9-10; leaf sheath glabrous; ligule very small, margin entire; auricles rounded, fringed with long white hairs; leaf blade linear-lanceolate, base obliquely rounded, apex acuminate, upper surface glabrous with hairy midrib, puberulous beneath, margins serrate; midrib prominent with lateral veins.

**4. *Bambusa vulgaris* Schrader. ex Wendl. Coll. Pl. 2: 26. 1810**

A moderate sized bamboo, not densely tufted, sympodial. Culm erect and arching over. Nodes solitary, slightly swollen, single nodal line present, glabrous, the basal one with short aerial roots. Internodes cylindrical, scattered dark hairs to glabrous with age, hollow with thick wall, powdered on inside wall, yellow with

green stripes. Branches produced at nodal line, arising from mid culm nodes, 2-7 branches, complement of dominant primary branch with secondary and tertiary orders, angled upward. Culm sheath stramineous, slightly broad triangular, the abaxial surface with compressed black hairs, the adaxial surface glabrous, both margins setaceous, hard, deciduous; ligule membranous, margin slightly serrated, ciliate; auricles reniform, fringed with pale brown bristles; culm blade triangular in shape, erect with acute apex, the abaxial surface glabrous, the adaxial surface slightly covered with hairs, both margins setaceous densely at the lower, persistent. Foliage leaves 11-15; leaf sheath slightly thick, upper surface with brown hairs, inner surface glabrous; ligule with sub-entire rim; auricles small lobes with bristles; blade narrowly-lanceolate shape, leaf base rounded, apex acuminate, both surfaces glabrous, but the base slightly scattered with hairs, both margins serrate, midrib prominent with lateral veins.

**5. *Bambusa wamin* A. Camus, Les Bambusees, 135.1913.**

A medium sized graceful bamboo, tufted, sympodial. Culm erect and arching outward, Nodes solitary, slightly swollen, single nodal line present, surface of nodes glabrous. Internodes little swollen pitcher shaped, the lower internodes are much shortened and swollen, rounded and hollow in cross section with thick wall. Branches produced at nodal line, arising from the upper parts of culm, 1-6 branches at each node, complement of dominant primary branch with secondary and tertiary orders, angled upward. Culm sheath stramineous, ovate to triangular, the abaxial surface covered with black to golden brown hairs, the adaxial surface leathery, margin entire, hard, deciduous; ligule membranous, margin serrate, ciliolate; auricles rounded and ciliated; culm blade narrow triangular-acuminate, reflexed, the abaxial surface covered with scattered hairs, the adaxial base hairy, margin serrate, deciduous. Foliage leaves 9-11; leaf sheath, the upper surface with pubescent; ligule membranous, margin entire; auricles small rounded with few bristles; leaf blade narrowly-lanceolate, leaf base rounded, apex aristate, margins serrate, both surfaces glabrous, midrib prominent with lateral veins.

**6. *Cephalostachyum pergracile* Munro Trans. Linn. Soc. London 26:141 (1868)**

A graceful tufted, sympodial bamboo. Culm erect with pendulous tip. Nodes solitary, slightly thickened, single nodal line present, glabrous, lower nodes with aerial roots. Internodes rounded in cross section with thin wall, a membrane layer present on inside wall. Branches produced at nodal line, arising from the higher nodes. Culm sheath reddish-brown, triangular in shape, the abaxial surface covered with appressed blackish stiff deciduous hairs at the lower portion, the adaxial surface glabrous, margin serrate, hard, tardily deciduous; ligule very narrow, margin entire, densely white ciliate; auricles horizontally extending the top of the sheath, densely wavy-bristly the margins; culm blade ovate, cordate, the tip cuspidate and reflexed, the abaxial surface glabrous, densely hairs on adaxial surface, deciduous. Foliage leaves 10-11; leaf sheath faintly striate, glabrous, ending in a small ciliate callus; ligule very narrow, margin entire; auricles small with 2-3 caducous white long bristles; leaf blade linear-lanceolate, leaf base cuneate, apex acuminate, both surfaces scabrous, margins sparsely pubescent beneath, midrib conspicuous with lateral veins.

**7. *Dendrocalamus giganteus* Munro in Trans. Linn. Soc. London 26:150 (1868)**

A very large evergreen tufted bamboo, sympodial. Culm erect. Nodes solitary, not swollen, single nodal line present, lower nodes developing aerial roots. Internodes covered with white-waxy when young, becoming glabrous, rounded in cross section of culm, hollow with thick wall, powdered on inside wall, white to greyish-green in color. Branches produced at nodal line, arising from mid culm nodes, 15-18 branches,

one dominant branch with several smaller branches and angled upward. Culm sheath pale-brown in color, widest of lower internode, covered with dark brown hairs on abaxial surface, smooth and shining adaxially, margin ciliate, hard, caducous; ligule present, stiff, margin serrate; auricles crisp, brown, not bristly; culm blade broadly triangular to lanceolate, reflexed, the apex acuminate, the abaxial surface glabrous, stiff and scattered hairs adaxially, especially near the base, deciduous. Young shoot purplish. Foliage leaves 9-10; leaf blade oblong-lanceolate, rounded at the base and acuminate at the apex, upper surface glabrous, lower surface scabrous, margins serrate, midrib prominent with lateral veins.

**8. *Dendrocalamus latiflorus* Munro Trans. Linn. Soc. Landon 26:152 (1868)**

Densely tufted sympodial bamboo. Culm erect and arching over. Nodes solitary, prominent, single nodal line present, brown ring above and below the node, lower nodes bearing aerial roots. Internodes covered with white waxy when young, rounded in cross section of culm, hollow with thick wall, powdered on inside wall, greyish green. Branches produced of nodal line, developed from lower nodes, about 4-7 branches, one dominant primary branch with smaller branches proliferating from its base and angled upward. Culm sheath rounded at tip, abaxial surface covered with dull brown pubescent, adaxial glabrous, hard and brittle, deciduous; ligule present, serrulate; auricles small, margin ciliolate; culm blade ovate to lanceolate, reflexed, the apex acuminate, the outer surface glabrous, inner surface pubescent at the base, deciduous. Foliage leaves 11-16; leaf sheath glabrescent; ligule serrulate; auricles small, no bristles; leaf blade oblong-lanceolate, leaf base obliquely rounded, apex acuminate, upper surface glabrous, lower surface scabrous, margins serrate, midrib prominent with lateral veins.

**9. *Dendrocalamus longispatus* (Kurz) Kurz Prelim. Rep. Forest Pegu, App. B: 94 (1875)**

Clumps tufted, sympodial bamboo. Culm erect. Nodes solitary, slightly swollen, single nodal line present, surface of nodes glabrous, lower nodes often rooting. Internodes covered with dark brown pubescent, rounded in cross section of culm, hollow with thin wall, powdered on inside wall, glaucous green when young, greyish green when old. Branches produced at nodal line. Culm sheath oblong, the abaxial surface densely covered with dark brown deciduous hairs especially beneath, the adaxial surface glabrous, hard, deciduous; ligule broad, much serrate or often long fimbriate; auricles inconspicuous; culm blade lanceolate-acuminate, recurved, the apex acuminate, the abaxial surface glabrous, scattered hairs adaxially, deciduous. Foliage leaves 7-10; leaf blade oblong-lanceolate, obliquely rounded at the base and acuminate at the apex, upper surface glabrous, lower surface scabrous, margins serrate, midrib prominent with lateral veins.

**10. *Dinachloa maclellandii* (Munro) Kurz J. Asiant. Bengal, Pt. 2, Nat. Hist. 42:353 (1873)**

A graceful densely tufted bamboo, sympodial. Culm erect, alternate joints bend in different ways giving a zigzag appearance, thick wall. Nodes solitary, slightly swollen, nodal line plus nodal ridge present, surface of nodes smooth and lower nodes produce short aerial roots. Internodes often covered with brown hairs on the surface, rounded in cross section, hollow, powder absent on inside the wall. Branches produced at nodal line, angled upward. Culm sheath cylindrical in shape and slightly wider below, the abaxial surface covered with deciduous scattered golden-brown hairs, the adaxial surface glabrous, the central hard and both margin soft, deciduous; ligule membranous, margin entire; auricles rounded with bristles the margin; culm blade broadly ovate in shape, erect, the apex acuminate, the abaxial surface glabrous,

the adaxial surface scabrous, margin entire, deciduous. Foliage leaves 13-15; leaf sheath slightly thick, upper surface with brown hair, inner surface glabrous; ligule membranous, margin entire; auricles with long hairs; leaf blade linear-lanceolate shape, leaf base obliquely rounded and apex acuminate, both surfaces glabrous, margins serrate, midrib prominent with lateral veins.

**11. *Gigantochloa atrovioleacea* Widjaja Reinwardtia 10:323 (1989)**

A handsome tufted bamboo, sympodial. Culm erect. Nodes solitary, slightly swollen, single nodal line present, glabrous, lower nodes with aerial roots. Internodes glabrous, rounded in cross section with thick wall, powdered on inside wall, dark green when young and dark brownish purple with ages. Branches produced at nodal line, pale brown in color, triangular in shape, yellowish-brown with dark brown appressed hairs on abaxially, the adaxial surface glabrous, ciliate at both margins, hard, deciduous; ligule present, irregularly dentate; auricles rounded, slightly curved outward, provided with bristles; culm blade triangular, spreading and reflexed, the apex acuminate, both surfaces glabrous, margin entire, persistent. Foliage leaves 7-15; leaf sheath covered with white hairs; ligule present, irregularly toothed; auricles small; leaf blade narrowly-lanceolate, leaf base rounded, apex acuminate, both surfaces glabrous, margins serrate, midrib prominent with lateral veins.

**12. *Gigantochloa macrostachya* Kurz J. Asiat. Soc. Bengal, Pt. 2, Nat Hist. 42:251 (1873)**

A large tufted bamboo, sympodial. Culm erect. Nodes solitary, slightly swollen, single nodal line present, surface of nodes glabrous, aerial roots present at lower nodes. Internodes covered with finely pubescent hairs, rounded in cross section of culm, hollow with thick wall, powdered on inside wall, whitish-green in color. Branches produced at nodal line. Culm sheath broader than long, contracted at the summit but still broad at the throat, hardly ciliate on the margins, the abaxial surface covered with white appressed hairs, the adaxial surface glabrous, soft, deciduous; ligule membranous, margin entire; furnish on both sides with two large sinuate auricles which are densely curved bristles; culm blade subcordate, erect, the apex acuminate, the abaxial surface glabrous, the adaxial surface hairy, deciduous. Foliage leaves 10-12; leaf blade linear-lanceolate, cuneate at the base and acuminate at the apex, upper surface glabrous, lower surface scabrous, margins serrate, midrib prominent with about lateral veins.

**13. *Melocan nabaccifera* (Roxb.) Kurz Prelim. Rep. Forest Pegu, App. B: 94 (1875)**

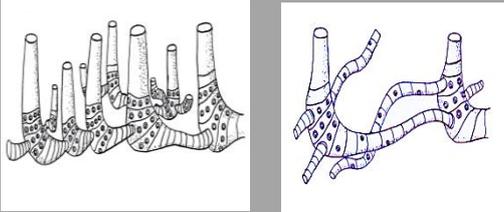
Clumps loosely tufted, sympodial. Culm erect and straight but with pendulous tips. Nodes solitary, slightly swollen with a circular band of white bloom little below, single nodal line present, glabrous, aerial roots absent. Internodes slender, glabrous, rounded in cross-section with thin wall, powder absent on inside walls, green when young and straw-colored when old. Branches produced at nodal line. Culm sheath truncate or concave apex, glabrous or sparsely whitish hairs on abaxially, the adaxial surface glabrous, margin entire, hard and brittle, persistent; ligule very short with toothed margin; auricles inconspicuous; culm blade basal triangular, erect with aristate apex, both surfaces glabrous, margin entire, persistent. Foliage leaves 9-10; leaf sheath glabrous; ligule very short, margin entire; auricles very small, with silvery bristles, leaf blade narrowly-lanceolate, leaf base obtuse, apex acuminate, both surfaces glabrous, margins finely ciliate, midrib prominent with about 18 lateral veins.

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

A graceful tufted, sympodial bamboo. Culm erect and straight. Nodes solitary, nodes not swollen, single nodal line present, smooth, without aerial roots. Internodes terete, smooth, hollow and absent of powder on inside wall, golden yellow often with green stripe. Branches produced at nodal line. Culm sheath the abaxial surface covered with yellowish-brown hairs, the adaxial surface glabrous, coriaceous, margin entire, hard, long persistent; ligule about 0.3cm long, margin entire, ciliate; auricles small, bearing crisped bristles; culm blade triangular with stiff apiculate apex, erect, rigid, both surfaces glabrous, margin entire, persistent. Foliage leaves 11-12; leaf sheath with yellowish-brown stiff hairs, sometime with yellow and green striped; ligule with ciliated membranous; auricles small with long bristles; leaf blade 20-40 x 3-7 cm, narrowly-lanceolate, leaf base cuneate, apex acute, both surfaces pubescent, leaf blade margins serrate, midrib prominent with lateral veins.

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

A very graceful tufted bamboo, sympodial. Culm erect. Nodes solitary, slightly swollen, single nodal line present, bases of culm usually covered with the persistent culm sheath, surface of node smooth, white ring below the nodes. Internodes glabrous, rounded in cross section, thick wall, almost solid with a very small lumen, grayish-green in color. Branches produced at nodal line. Culm sheath attenuate upwards to a waxy truncate top, covered with white appressed pubescence on abaxially, the adaxial surface lathery, margin entire, soft, persistent; ligule narrow, slightly toothed, glabrous; auricles small, rounded triangular, ciliate; culm blade narrowly triangular, the edge incurved, erect, the apex acuminate, the outer surface glabrous, the inner surface pubescent, persistent. Foliage leaves 6-9; leaf sheath glabrous; ligule very short, margin entire; auricles inconspicuous; leaf blade linear-lanceolate, leaf base obliquely rounded, apex aristate, both surfaces glabrous, margins serrate, midrib prominent with lateral veins.



Rhizome system



Aerialroot



Branching style



Culm sheath



Culm shape



Culm size

### Uses of Bamboo

#### ***Bambusa bambos* Voss**

*Bambusabambos* Voss is cultivated as a natural green fence. It is used to construct trellises which are used to grow the vine vegetables. The young shoots are edible.

#### ***Bambusa nutans* Wall**

*Bambusanutans* Wall has the property of strength and durability: easily bears the weight of workers their tools and other materials. So it is widely used for construction projects and scaffolding. It is also used as fence, trellis, and a cover for a drinking water pot. The shoots are edible.

#### ***Bambusa tulda* Roxb**

The thin-short, flexible bamboo strips used as the kind of strings were especially made from *Bambusatulda* because of their long internodes and thick culm. Depending on the thickness of strips, it is used for basketry. Bamboo handles for broom made from solid culm of *Bambusatulda* are found in Mhawbi Township. The young shoots are edible with small bitter taste.

#### ***Bambusa vulgaris* Schrael Ex Wendl**

It is widely used as ornamental plants. It often planted as fences and border hedges. It is also planted a measure for erosion control. The shoots are edible.

***Bambusa wamin* A Camus**

One of the highly ornamental value and widely cultivated not only at restaurant but also living house and school in Yangon Area.

***Cephalostachyum pergracile* Munro**

The culms are easily spilt into thin strips and which are used for basketry. The outer green layer can be spilt very finely and is used to make handicrafts. Because of its toughness and durability, *Cephalostachyum pergracile*, it is used for bamboo mat and bamboo matted wall. Flexible bamboo strips used as the kind of strings were especially made from their long internodes. Other baskets like container for grass, cloths, container for fruit and vegetable, tissue box, fish trap, bamboo basket for chicken, fish carrier, basket for washing rice etc. The glutinous rice seated in bamboo is one of the most famous palatable foods of Myanmar and is especially made by using *Cephalostachyum pergracile*. The kauknyin-kyi-daug can be removed without sticking to bamboo slat because the rice was covered with membranous while layer of the inner part of bamboo and is favored with bamboo essence. It is very famous traditional food of Myanmar. The shoots are edible but have bitter taste.

***Dendrocalamus giganteus* Munro**

*Dendrocalamus giganteus* is the tallest bamboo and are used for poles of houses. Sometimes the large culms are spread into sheets and used as floors. Furniture such as tables and chairs are made by various techniques. Because of its larger hallow girth, durability and toughness; it is used as gutters which are fitted below and along the caves of the thatched hut or house to collect rain water. One of the Myanmar traditional and classical musical instruments of Xylophone; which the bars are made especially from *Dendrocalamus giganteus*. The large culm sheath is used to make hats. The young shoots are edible and a commercially important edible bamboo as it produces large sized shoots and salted pickles (wabomyint chin). The upper part of bamboo cup is decorated with desirable image by using modern technique; Bamboo lamps with beautiful design are also made from this bamboo.

***Dendrocalamus lactiflorus* Kurz**

It is used for floor, pole of house, bamboo matted wall. Moreover, it is also used for basketry. Young shoots are edible.

***Dendrocalamus longispathus* Kurz**

A kind of fencing material, bamboo matted wall was almost found to be made from *Dendrocalamus longispathus*. The young shoots are edible.

***Dinochloa maccllellandii* (Munro) Kurz**

It is cultivated as ornamental and this species is rare; only one clump is found in the study area.

***Gigantochloa artroviolacea* Widjaja**

It is commonly used as column of house for building as well as floor. Its durability and strength with stands large amounts of weight is also used for footbridges in the study areas. It is also used as greasy poles for one of the Myanmar traditional seasonal games. The young shoots are edible.

***Gigantochloa macrostachya* Kurz**

It is used as scaffolding which is a temporary bamboo frame-work for supporting worker men and materials during the erecting, repairing, painting or building, or other constructions.

### ***Melocan nabaccifera* (Roxb) Kurz**

One of the most useful bamboos in the area in its nativity; the principal material used for building houses, for weaving were and is an important source of superior paper pulp. Stands of *Melocan nabaccifera* have been used to make a kind of paper in Myanmar for centuries and before invention of paper, strips of bamboo were strung together with thread or wire and used as book. It is also cultivated as ornamental purposes in the study area. The fruits and young shoots are edible.

### ***Schizostachyum brachycladum* Wall**

*Schizostachyum brachycladum* is cultivated as precious ornamental plant for its golden colored culms. The young shoots are edible.

### ***Thyrsostachys siamensis* Gamble**

*Thyrsostachys siamensis* Gamble is cultivated as wind break as well as ornamental. Traditional musical instrument of flute was made from this bamboo. It produced beautiful sound with different tunes. Handles of the fire extinguisher used to prevent fire hazards. Many kinds of umbrellas are produced in many countries, but Myanmar Traditional Umbrellas are specific and distinctive among them because of interesting skilled and workmanship. It is called pa-thein-Htee. The kings of Myanmar kingdom wore the big Umbrella called Htee Taw. The shaft and ribs of the Umbrella are made of *Thyrsostachys siamensis*. Young shoots are cooked and eaten as a vegetable. They are considered to be among the best of bamboo shoots.

## **Discussion and Concluton**

The grass family Gramineae (Poaceae) is one of the largest in number of genera and species among flowering plants. The subfamilies are systematically arranged according to Halfliger and Scholz's classification (1981). These (5) subfamilies are Bambusoideae, Oryzoideae, Pooideae, Chloridoideae and Panicoideae.

In the present study 15 species that belong to 8 genera, 2 subtribes and 1 tribe have been identified. The genus *Bambusa*, *Dendrocalamus*, *Dinochloa*, *Gigantochloa* and *Thyrsostachys* are included in the subtribe Bambusinae. The genera *Cephalostachyum*, *Melocanna* and *Schizostachyum* are included in the subtribe of Melocanninae. They are systematically classified according Clark *et al.* (2015). Most of the genera are native to tropical Asia. *Bambusa* is the wider spread genus of bamboos in study area (Yangon Division).

Bamboo is used to build houses, valuable for construction and preparation of daily utensils. Bamboo shoots are edible and the bamboo leaves are used as animal fodder. Because of bamboo can produce more oxygen and absorb more carbon dioxide than other trees, and also maintain the soil, bamboos could be also cultivated to maintain the environment.

Various types of soil, some valuable species are naturally distributing in the study area. Nowadays, the products produced by bamboos are being traded to export of high quality by modern techniques. Therefore, bamboo is precious which is useful for our society, business and in many aspects, is a precious gift from nature.

The climate of the studies area is tropical monsoon and having efore further systematic studies of Bambusoideae could give the valuable information as the plant resources of bamboo and the data can be partially accomplished to the compilation of Bambusoideae of Myanmar.

### References

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