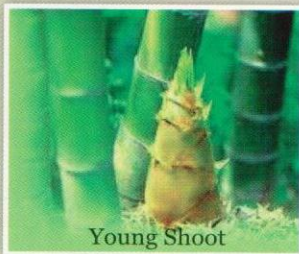


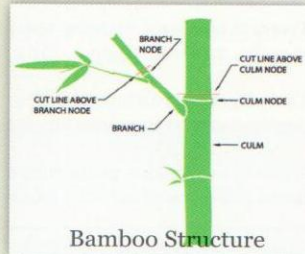
## BAMBOO! NOT JUST A NATURE



Bamboo is a monocotyledon plant in the grass family Poaceae. A young shoot of bamboo protected by a series of sheaths, which will fall off as the shoot grows into a mature culm. Most bamboos are hollow, where in the hollow inner area, some horizontal partitions called "diaphragms". On the outside, these partitions are denoted by a ring around the culm. A diaphragm and the ring on the outside together form a "node". Branches grow from these nodes. The part between two nodes is called an "internode".



Young Shoot



Bamboo Structure

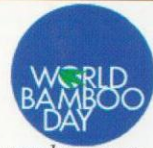
Bamboo has the remarkable ability to create an "ambient", in the artistic sense of the term. The beautiful composition of leaves and culms, often in rich colors, has inspired poets and painters from the ancient to the modern times. In many modern shopping centers and office buildings around the world, bamboo's stately elegance makes it a cherished component of architectural design. But even in countries with cold climates – such as the Western European nations and the US – bamboo can be found in many gardens and parks as the bamboo lovers in these places seem to have developed an instinct for growing species that can survive cold winters.

Kingdom	: Plantae
Order	: Poales
Family	: Poaceae
Subfamily	: Bambusoideae
Supertribe	: Bambusodae
Tribe	: Bambuseae

Being the fastest growing plant on earth, due to the unique rhizome-dependent systems Bamboo is now identify as economic and cultural significance in South

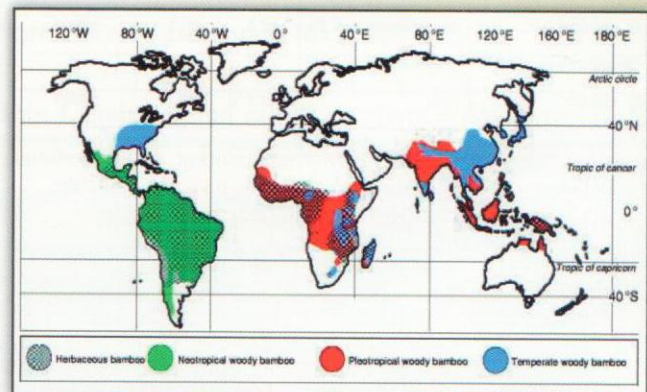
### An Appreciation:

World Bamboo Day,  
September 18<sup>th</sup> 2012



**Question:** "Why on earth would people want to celebrate a plant?"

**Answer:** Bamboo is a great plant. For one thing, it's highly versatile- a recent British Broadcasting Corporation article states that bamboo can be used in around 1 500 ways, from construction material and furniture to food and bicycles. No wonder people are calling it 'new super material', it's highly versatile.



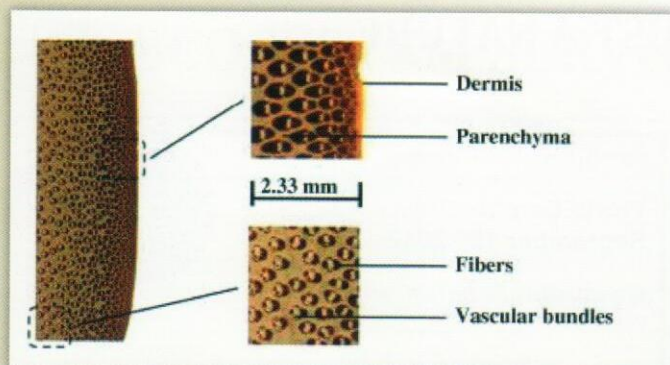
World distribution of woody (paleotropical, neotropical, temperate) and herbaceous bamboos (Source: Das et al., 2008)

Asia, Southeast Asia and East Asia. Bamboo has been proven to have greater strength, if not comparable, to that of timber. In Burma and Bangladesh, about 50% of the houses are made almost entirely of bamboo. In Java, woven bamboo mats and screens are commonly used in timber house frames. With modern polymer glues and bonding cements, bamboos are made into plywood, matboard and laminated beam.

### Structure of bamboo

The microstructure of culm wall can be seen Figure below. The outside of the culm wall (rightside of the picture) is dense, as can be seen from the dark color. This layer contains much silica, a good material to protect the plant, but a nuisance for tools as silica blunts their sharp edges within a short time. Approximately, a bamboo culm has 40% fibers, 10% vessels and 50% parenchyma.





A typical anatomical structure of bamboo

Mechanical properties of bamboo culms and timber species from different countries

Species	Country	SG	MC (%)	MOR (Nmm <sup>-2</sup> )	MOE (Nmm <sup>-2</sup> )
<i>Bambusa bambos</i>	India	0.65	15.5	67.4	6500
<i>B. blumeana</i>	Philippines	0.50	green	30.8	8640
<i>B. mutans</i>	Bangladesh	0.68	12.8	87.7	12900
<i>B. tildie</i>	India	0.71	14.9	50.6	8265
<i>B. vulgaris</i>	Indonesia	na	17.0	86.0	na
<i>B. balcooa</i>	Bangladesh	0.74	12.5	80.3	10900
<i>Dendrocalamus asper</i>	Indonesia	na	15.0	1.05	na
<i>D. strictus</i>	India	0.72	10.7	118.4	15949

Note: SG= Specific gravity; MC= Moisture content; MOR=Modulus of rupture; MOE=Modulus of elasticity; na = not available  
(Sources: Sattar, 1995; Anon, 2006; Anwar, 2008)

List of some bamboo species in Malaysia:

No	Species	Local Name	Note
1	<i>Bambusa blumeana</i>	Buluh Duri	Chopstick, tooth picks, furniture, musical instrument, poles, shoot as food
2	<i>Bambusa heterostachya</i>	Buluh galah/tilan/ pering	Poles, frames, tooth picks, blinds, skewer sticks
3	<i>Bambusa vulgaris</i>	Buluh minyak/aa/ aro/gading/tamalang	Ornamental, tooth picks, chopsticks, skewer sticks, shoot as food
4	<i>Bambusa vulgaris var striata</i>	Buluh gading	Ornamental
5	<i>Dendrocalamus asper</i>	Buluh beton/pering	Shoots as food, chopsticks
6	<i>Dendrocalamus pendulus</i>	Buluh akar/belalai	Handicraft, basket
7	<i>Gigantochloa 'Brang'</i>	Buluh brang	Shoots as food, chopsticks, skewer sticks, tooth picks
8	<i>Gigantochloa levis</i>	Buluh beting/bias	Shoots as food, chopsticks
9	<i>Gigantochloa ligulata</i>	Buluh tumpat/tikus belalai	Frames, shoots as food, poles for vegetable support
10	<i>Gigantochloa scortechinii</i>	Buluh semantan	Handicraft, small scale industries, incense sticks
11	<i>Gigantochloa wrayi</i>	Buluh beti/raga	Handicraft, small scale industries, incense sticks
12	<i>Schizostachyum brachycladum</i>	Buluh nipis/lemang	Handicraft, rice vessels (lemang)
13	<i>Schizostachyum grande</i>	Buluh semeliang/ semenyeh	Frames, leaves used for wrapping Chinese glutinous rice dumpling
14	<i>Schizostachyum zollingeri</i>	Buluh dunding/kasap/ telor/nipis	Handicraft, tooth picks, skewer stick
15	<i>Bambusa arundinacea</i>	-	
16	<i>Bambusa burmanica</i>	Buluh aloh bukit	
17	<i>Bambusa glaucescens</i>	Buluh pagar	
18	<i>Bambusa ventricosa</i>	-	
19	<i>Bambusa ridleyi</i>	Buluh akar	

## Bamboo Applications :

- **Bamboo shoots**- are edible and a major components of Asian dishes
- **Landscaping**
- **Chopstick, tooth pick**
- **Bamboo wine** - made from fermented juice of the wine bamboo (*Oxytenanthera braunii*) in Tanzania!
- **Bamboo canes** - use mainly for make cooking utensil, blow guns, toy & furniture
- Wooden sword called a "**shinai**" used in Japanese martial art Kendo normally made from strips of strong bamboo culms

- **Building materials**-large timber bamboo (e.g. *Dendrocalamus giganteus* & *Bambusa oldhamii*) –scaffolding, bridge-building, water pipe, storage vessels and houses
- **Music instruments** in most of Asian countries- e.g. shaku hachi (in Japan), made from the lower end of small-culmed bamboos, the Chinese xiao, a notche flute played in modern orchestras



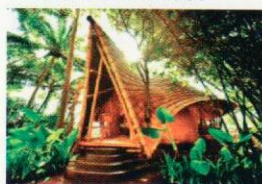
Bamboo Shoot



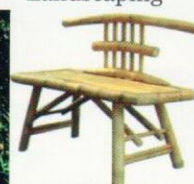
Landscaping



Shinai



House From Bamboo



Bamboo Chair



Music Instruments

## INFO :

Tropical bamboos growing 100 feet in three months, an astonishing 0.0002 miles per hour!

Tasty Bamboo worms are edible for Thailand! Bamboo can be turn into fabric too!

It has great wicking properties & antimicrobial (that is can kill microorganisms like bacteria)



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