

A note on the bamboo diversity and utilization from Manipur in N.E. India

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Abstract

Manipur, situated in the Indo-Myanmar Hotspot region is known for its scenic beauty and natural endowments. By virtue of its topography and varied climate, diverse forest types are available ranging from tropical to temperate montane. The climatic condition is congenial to bamboo growth. The state harbors diverse species of bamboos. The present paper deals with bamboo diversity from Manipur along with the utilization aspects. Bamboos grow luxuriantly in hills and plains and form an important component of rural landscape. It is a culture in Manipur to grow bamboo in homesteads. They provide important uses for subsistence of rural livelihood.

Key word: Hotspot, Bamboo diversity, Homestead, Subsistence

INTRODUCTION

The Indian state of Manipur is situated in the Northeast border of India and it lies within Indo-Myanmar Hotspot region. Its geographical location is 23° 50' N to 25° 42' N latitudes and 92° 58' E to 94° 45' E longitudes on the laps of Himalayan ranges with an area of 22,237 sq km. Besides, famous for its fascinating scenic beauty, abundant natural endowments and rich cultural heritage, Manipur has tropical to sub-tropical to temperate montane forests within its territory. By virtue of its varied climatic conditions, various species of bamboo grows here luxuriantly, both in the hills and in the plains of Manipur. Hollow woody culms, complex branching, extensive rhizome system and infrequent flowering are some of the distinguishing characteristics of this group of plants. One of the most difficult aspects of bamboo-taxonomy is the supra annual interval of its flowering. Depending on the species, flowering in bamboo occurs annually or up-to an interval of 120 years (Austin *et al* 1970). Published systems of bamboo classification has put the bamboo genera between 60 – 90 with 1000 – 1500 species (Dransfield & Widjaja 1995; William & Rao 1994). About 192 species of bamboos have been reported from Asia Pacific region (Sharma 1982). Gamble (1896) reported 15 genera and 115 species of bamboos from India. The North Eastern region holds more than two-thirds of the total growing stock of the country (Tripathi 2008). Manipur, alone has the richest diversity of bamboo with 53 species (Devi & Sharma 1993).

MATERIALS AND METHODS

The study was conducted by visiting the bamboo growing areas in hills and plains of Manipur. Specimens were collected; photographed and their local names and uses were also re-

corded. Collected specimens were processed into mounted herbarium sheets following Jain & Rao (1977) and the plants were identified consulting a number of literature including Bor (1940) and Deb (1983, 1984). However, taxonomic delimitation of different genera and species are mostly based on Naithani *et al* (2010). Voucher specimens were deposited in the Herbarium of the Department of Life Science, Manipur University.

RESULTS AND DISCUSSION

According to earlier reports (Bhaumik *et al* 2006; Deb 1961; Devi & Sharma 1993; Devi & Singh 2007; Karthikeyan 1983; Naithani *et al* 2010; Sharma 1982; Shukla 1996) and from our study, 45 species of bamboos are growing in hills and plains of Manipur. These include 13 species of *Bambusa* along with one variety, 4 of *Cephalostachyum*, 1 of *Chimonobambusa*, 1 of *Chimonocalamus*, 9 of *Dendrocalamus*, 2 of *Drepanostachyum*, 2 of *Gigantocloa*, 1 of *Himalayacalamus*, 2 of *Melocalamus*, 1 of *Melocanna*, 1 of *Neomicrocalamus*, 1 of *Pseudostachyum*, 3 of *Schizostachyum*, 1 of *Thyrsostachys* and 2 of *Yushania*.

Table 1. Different species of bamboos recorded from Manipur

Species	Locality	Voucher specimen / Reference
<i>Bambusa balcooa</i> Roxburgh	Jiribam	BPMRN-005
<i>Bambusa bamboos</i> (Linnaeus) Voss	Ukhrul District	BPMRN-007
<i>Bambusa binghamli</i> Gamble	Imphal East & West District	BPMRN-009
<i>Bambusa cacharensis</i> R.B. Majumdar	Imphal & Commonly cultivated Jiribam	BPMRN-067
<i>Bambusa jaintiana</i> R.B. Majumdar	New Kaiphundai area	Karthikeyan 1983
<i>Bambusa kingiana</i> Gamble	Irong, Manipur	Devi & Sharma 1993
<i>Bambusa manipureana</i> Naithani & Bisht	Khongkhang, Chandel District	Naithani <i>et al</i> 2010
<i>Bambusa mizorameana</i> H.B. Naithani	Kangla village charoi Tupul, Bishnupur, Nagrian village, Kassom Khullen village. Commonly planted in valley	BPMRN-032
<i>Bambusa nutans</i> Wallich <i>ex</i> Munro	Konglon, very common in Imphal East, West Thoubal, Bishnupur	BPMRN-020
<i>Bambusa schizostachyoides</i> Kurz <i>ex</i> Munro	Leimaram village (Bishnupur)	Shukla 1996
<i>Bambusa tulda</i> Roxburgh	Kangla village, Imphal-Thoubal commonly grown in valley	BPMRN-029
<i>Bambusa vulgaris</i> Schrader	Jiribam area	Deb 1961
<i>Bambusa vulgaris</i> var. <i>vittata</i> A & C Riviere	Cultivated area	Gamble 1896; Naithani <i>et al</i> 2010
<i>Bambusa vulgaris</i> f. <i>waminii</i> Wen	Planted at Mantripukhri Forest complex (Imphal East)	Naithani <i>et al</i> 2010
<i>Cephalostachyum capitatum</i> Munro	Charoi Tupul Ngarain village near Bishnupur, Ukhrul	Naithani <i>et al</i> 2010

Species	Locality	Voucher specimen / Reference
<i>Cephalostachyum pallidum</i> Munro	Koubru	Deb 1961
<i>Cephalostachyum pergracile</i> Munro	Khrukhul, Imphal Moreh road, Chandolpokpi Khongkhang cultivated at Morey	Deb 1961
<i>Cephalostachyum latifolium</i> Munro	Ramvha area on the way to Ukhul	Deb 1961
<i>Chimonobambusa callosa</i> (Munro) Nakai	Koubru, Kounu Siroy peak, Laimaton hill	BPMRN-035
<i>Chimonocalamus griffithianus</i> (Munro) Hsueh & T.P. Yi	Gammon, Ukhul, Haochong	Naithani <i>et al</i> 2010
<i>Dendrocalamus brandissii</i> (Munro) Kurz	Chandel	BPMRN-017
<i>Dendrocalamus hamiltonii</i> Nees & Arnott <i>ex</i> Munro	Charoi, Tupul, Lokchao near Moreh, Imphal Jiribam Road, Imphal-Ukhul road Mapi village, Chandel District, common throughout Manipur	BPMRN-024
<i>Dendrocalamus hookerii</i> Munro	Tengnoupal, Bishnupur,, Khongkhang, Kangpokpi range in Maoling village, Sipijang near Saitu	BPMRN-018
<i>Dendrocalamus latiflorus</i> Munro	Tengnoupal, Ukhul, Imphal, Teretkhun village, Imphal-Kohima road	BPMRN-013
<i>Dendrocalamus longispathus</i> (Kurz) Kurz	Laiching near Moreh, Bishnupur, Churchandpur, Khonglon, Sparmeina	Naithani <i>et al</i> 2010
<i>Dendrocalamus manipureanus</i> Naithani & Bisht	On the way to Ukhul, Sinaiveng Moreh, Lilong, Thoubal.	Naithani <i>et al</i> 2010
<i>Dendrocalamus membranaceus</i> Munro	Chandel	Naithani <i>et al</i> 2010
<i>Dendrocalamus sikkimensis</i> Gamble <i>ex</i> Oliver	Charoi Tupul	Naithani <i>et al</i> 2010
<i>Dendrocalamus strictus</i> (Roxburgh) Nees	Thoubal	BPMRN-047
<i>Drepanostachyum falcatum</i> (Nees) Keng <i>f.</i>	Khoubru, Shiroy hills	Naithani 1987; Naithani <i>et al</i> 2010
<i>Drepanostachyum kurzii</i> (Gamble) Pandey <i>ex</i> D.N. Tewari	Mao, Maram (Senapati)	Deb 1961
<i>Gigantochloa nigrociliata</i> (Buse) Kurz	Charoi Tupul Ukhul	Naithani <i>et al</i> 2010
<i>Gigantochloa macrostachya</i> Kurz	Lokchao Moreh	Devi & Singh 2007
<i>Himalayacalamus hookerianus</i> (Munro) Stapleton	Maohing village, Kangpokpi range (Senapati)	Naithani <i>et al</i> 2010
<i>Melocalamus compactiflorus</i> (Kurz) Bentham	Jiribam & Tipaimukh	Naithani <i>et al</i> 2010
<i>Melocalamus indicus</i> R.B. Majumdar	Jiribam	Naithani <i>et al</i> 2010
<i>Melocanna baccifera</i> (Roxburgh) Kurz	Lokchao, Chandel District beteen Imphal Irang, Kangla village	BPMRN-057

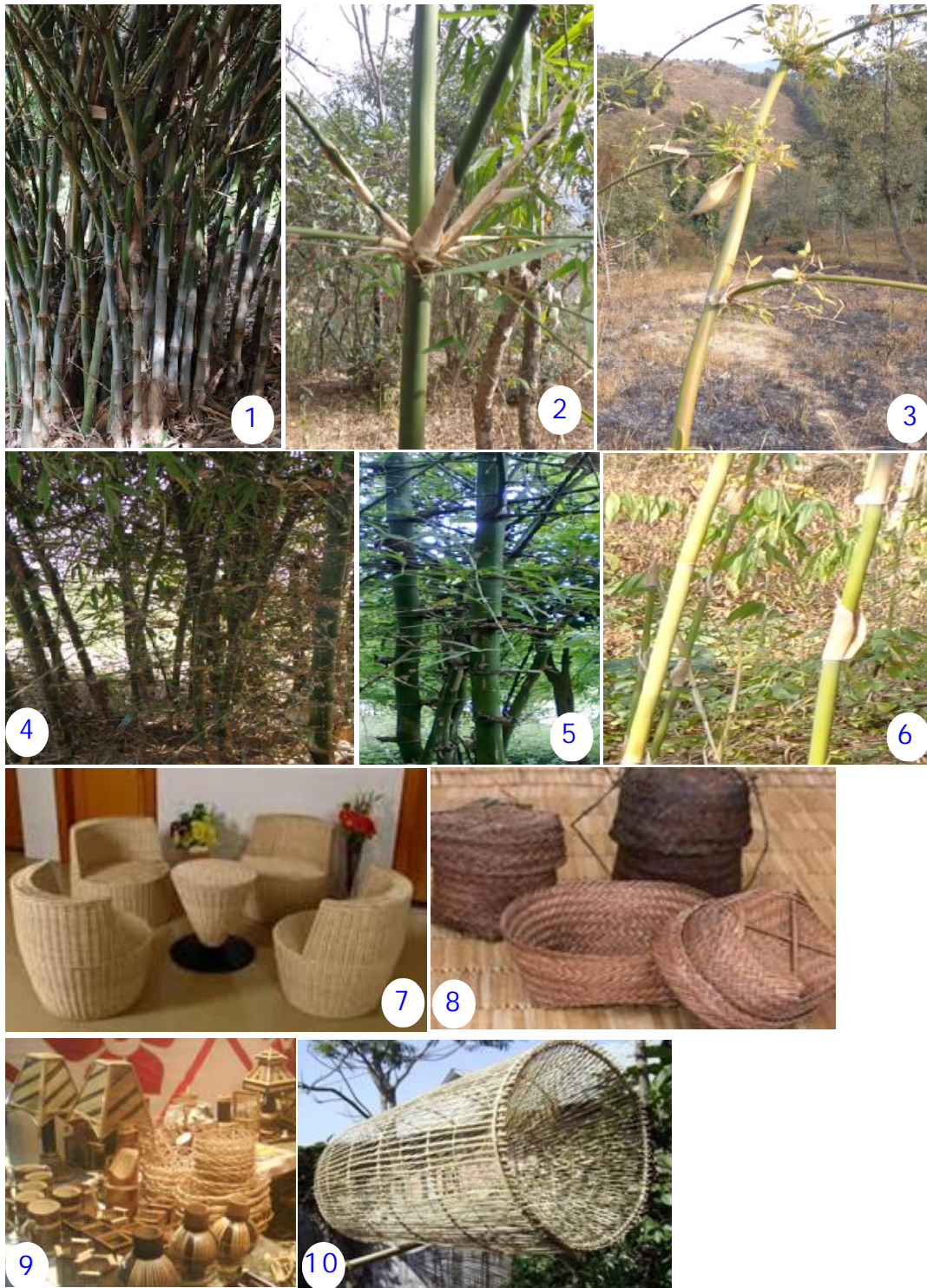


PLATE - I: Figs. 1 - 6: Some species of Bamboo found in Manipur. **1.** *Dendrocalamus hamiltonii*; **2.** *Bambusa tulda*; **3.** *Bambusa balcooa*; **4.** *Bambusa nutans*; **5.** *Bambusa bamboos*; **6.** *Melocanna baccifera*. **Figs. 7 - 10.** Bamboo products of Manipur. **7.** Furniture; **8.** Baskets; **9.** Handicraft; **10.** Fishing trap.

Species	Locality	Voucher specimen / Reference
<i>Neomicrocalamus prainii</i> (Gamble) Keng f.	Mao, Khoubru ang Nunghar village (Ukhrul)	Naithani <i>et al</i> 2010
<i>Pseudostachyum polymorphum</i> Munro	Tengnoupal, Mapi village (Chandel)	Naithani <i>et al</i> 2010
<i>Schizostachyum dulloa</i> (Gamble) R.B. Majumdar	Kohima Imphal Road TM Kassom on Ukhrul common on Jiribam Imphal road	BPMRN-031
<i>Schizostachyum latifolium</i> Gamble	I.T road, Kangpokpi road, Khoubru range, Saivom on the way to Moreh Siroi	Shukla 1996; Naithani <i>et al</i> 2010
<i>Schizostachyum mannii</i> R.B. Majumdar	Charaoi-Yandongba near Tupul, Imphal-Jiribam road	Shukla 1996; Naithani <i>et al</i> 2010
<i>Thyrsostachys oliveri</i> Gamble	Moreh, Imphal, Churchanpur, Imphal-Kohima road	Shukla 1996
<i>Yushania elegans</i> (Kurz) R.B. Majumdar	Common in Ukhrul, on the way to Shiroy hills	Naithani <i>et al</i> 2010
<i>Yushania rolloana</i> (Gamble) T.P. Yi	Dzuko hills, Shiroy hills, Koubru (Senapati)	Bhaumik <i>et al</i> 2006; Naithani <i>et al</i> 2010

In the hills bamboos grow extensively. In the valley, people grow bamboo in their homesteads and in farms. Local people prefer to grow species like *Bambusa cacharensis*, *Bambusa nutans*, *Bambusa tulda*, *Bambusa vulgaris* etc. which are used extensively for house construction, scaffolding, poles etc.

Table 2. Utility spectrum of some common Bamboo species in Manipur

Species	Construction	Food	Implements	Handicrafts	Fodder
<i>Bambusa balcooa</i>	+	+	+	+	+
<i>Bambusa cacharensis</i>	+	+	+	+	+
<i>Bambusa jaintiana</i>	+	-	+	+	-
<i>Bambusa mizorameana</i>	+	-	+	+	+
<i>Bambusa nutans</i>	+	+	+	+	+
<i>Bambusa tulda</i>	+	-	+	+	+
<i>Bambusa vulgaris</i>	+	-	+	+	+
<i>Dendrocalamus hamiltonii</i>	+	+	-	-	+
<i>Dendrocalamus hookeri</i>	+	-	+	-	+
<i>Dendrocalamus latiflorus</i>	+	+	-	+	-
<i>Dendrocalamus longispathus</i>	+	+	-	+	-
<i>Dendrocalamus manipureanus</i>	+	-	-	+	+
<i>Melocanna baccifera</i>	+	-	-	+	-
<i>Pseudostachyum polymorphum</i>	-	-	-	+	+
<i>Schizostachyum dulloa</i>	-	-	+	+	+
<i>Schizostachyum mannii</i>	-	-	-	+	+

On the commercial basis, these bamboos fetch good price in the market. Other species which grow in homesteads are *Bambusa mizorameana*, *Dendrocalamus hookeri* and *Dendrocalamus manipureanus*, *Dendrocalamus latiflorus* is grown in homesteads but found to be not very common. In Churachanpur and Jiribam districts of Manipur, *Melocanna baccifera* is grown in large extent on the hill slopes. Bamboo based cottage industry provides jobs and supplement income for the poor people of the state (Devi & Singh 2007). Local people have good knowledge on the propagation and cultivation of bamboo and it is a culture to grow bamboo in their homestead. Rural people depend on bamboo resources for their subsistence. They extract bamboo from forests and homestead gardens to make various bamboo products. Bamboo craft is intricate with the Manipuri society and they depend on bamboo products for their day-to-day use.

CONCLUSION

Bamboos are multipurpose plants, widely harvested from natural forest and cultivated. Their uses are dependent upon the characteristics of individual species such as culm strength, flexibility and size. The strength of culm, their straightness and lightness, combined with hardness, range in size, hollowness, long fibre and easy working qualities make bamboo suitable for a variety of purposes (Bhol & Nayak 2009). More than 1500 applications of bamboo has been documented worldwide of which major ones include use as building materials, agriculture implements, furniture, musical instruments, food items, handicraft, raw materials for large bamboo based industries like paper & pulp packing (Kishwan & Goyal 2006). Besides, bamboo is an environment friendly resource which acts as a net carbon sink, producing 35% more oxygen than equivalent stands of trees (Isagi *et al* 1993). The anti-erosion properties are key to the bamboo reputation as a useful soil conservation tool (Tripathi 2008). Nature has endowed the state with huge resource of bamboo. However, due to maximum extraction of bamboo from the natural habitat, rich bamboo resources of the state are depleting in the land of its birth. In addition, in the urban areas, people are dropping the culture of planting bamboos in their homesteads. Bamboos were planted in homesteads to meet their needs and as wind brakes. Bamboo resource is shrinking steadily; hence rural populace is looking for alternatives to earn their subsistence. It is high time to spread awareness at the local and governmental level about the economical as well as environmental security bamboo provides.

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