



BAMBOOS: DIVERSITY AND ITS UTILIZATION IN MEGHALAYA, NORTHEAST INDIA

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Abstract

Bamboo which belongs to the Poaceae (grass) family has been found chiefly in warm or tropical regions and it is an extremely important component in the lives of the indigenous people of Meghalaya. It is a fast growing, widespread, renewable, versatile and environment-enhancing resource. Apart from its traditional uses, bamboo has various new applications as an alternative to rapidly depleting wood resources and as an option to many expensive construction and furnishing materials. It stands as an ideal species capable of maintaining conservation of soil and moisture, restoration of degraded land, livelihood and economic security due to its manifold uses and industrial applications. A total of 30 species under 14 genera were recorded and out of which a total of 23 species have been used traditionally in the livelihood of mankind by the different ethnic societies of state. The most commonly used species of bamboos are *Bambusa balcooa*, *Bambusa bambos*, *Bambusa cacharensis*, *Bambusa jaintiana*, *Dendrocalamus hookeri*, *Dendrocalamus hamiltonii*, *Melocanna baccifera*, *Schizostachyum mannii*, *Schizostachyum helferi*.

Key words : Bamboo diversity, Meghalaya, Market value, Poaceae.

Introduction

Bamboos, the green gold, formed poor man's timber providing all the necessary materials to replace timber products. They are among the Earth's most beautiful and useful plants, providing outstanding texture and form as screens, hedges and ground cover. Bamboos often constitute a separate forest sub-type or occur as brakes (Champion & Seth, 1968). According to Ohrnberger (1999), the subfamily Bambusoideae comprises 1,575 species of woody and herbaceous bamboos worldwide. The first published scientific work on Indian bamboos, among other plants, was by Heinrich Van Rheede in his "Hortus Malabaricus" consisting of 12 volumes, the first of which appeared in 1678. The first comprehensive work on bamboos of India Myanmar and Malaya was a monograph prepared by Gamble (1896), and Blatter (1929). Bor (1938, 1940) also added on the treatment of bamboos of North East India.

Many workers in the past have received very little attention but only few workers like Naithani (2008) have been published. In Meghalaya the lives of people, both urban and rural, are so intrinsically dependent upon

bamboo for its variety of uses, that it is hard to imagine life without it. Probably no other plant benefits the earth's inhabitants in so many ways as do the bamboos. Though few floras were written in Meghalaya i.e., *Flora of Jowai* (Balakrishnan, 1983), *Flora of Nongpoh* (Joseph, 1982) and *Forest flora of Meghalaya* (Haridasan & Rao, 1987) however it does not satisfactorily represent the bamboos of the state. The hills are very rich in bamboo diversity and hence it is very much indispensable to explore this untouched region from a botanical perspective. The present study will help us to enhance our knowledge and understanding on the bamboos of this area.

Materials and Methods

Study site

The study has been conducted in the state of Meghalaya, which lies between 25°47' and 20°10' N latitudes and 89°45' and 92°47' E longitudes in North East India and covers an area of 22,429 Sq.km. The topography of the state is undulating with an elevation range between 50-1980 m a.s.l. The climate of the area is monsoonic with distinct warm wet and cold dry seasons and rainfall usually occurs during the period May-September. The average monthly temperature ranged

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from 33°C to 14°C at lower altitudes and 26°C to 8°C at higher altitudes.

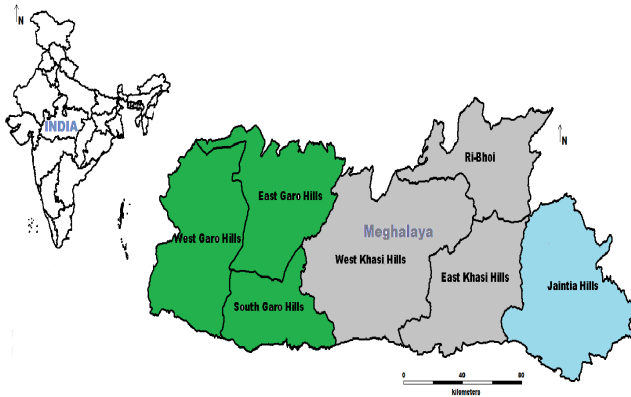


Fig 1. Map of Meghalaya.

Data collection and analysis

Extensive field survey was carried out from 2015-2017 to survey and sample the bamboo species along with their distribution patterns in the different districts of

the state. The bamboos collected were preserved according to standard herbarium techniques by Jain & Rao (1977) and identification was done with the help of latest monograph, available publish literature consulting and comparing with authentic specimens preserved in the NEHU herbaria and in Botanical Survey of India 'ASSAM' Shillong. A proper documentation on the utilization of the bamboos by the different tribes of the state in their day to day life was done. Local marker are also being surveyed for the price range for the different bamboo products that are sold in the market.

Results and Discussion

The present study reveals a total of thirty species (30) under fourteen genera (14) from different districts of Meghalaya (Table 1). The genus *Bambusa* recorded the highest number of plant species (11), followed by *Dendrocalamus* (4), *Chimonobambusa*, *Phyllostachys*, *Schizostachyum* (2 each) and the remaining species are monospecific. The highest numbers of species were found in Khasi hills with a total of 30 species followed by Jaintia hills with 14 species and lastly Garo hills with 10 species.

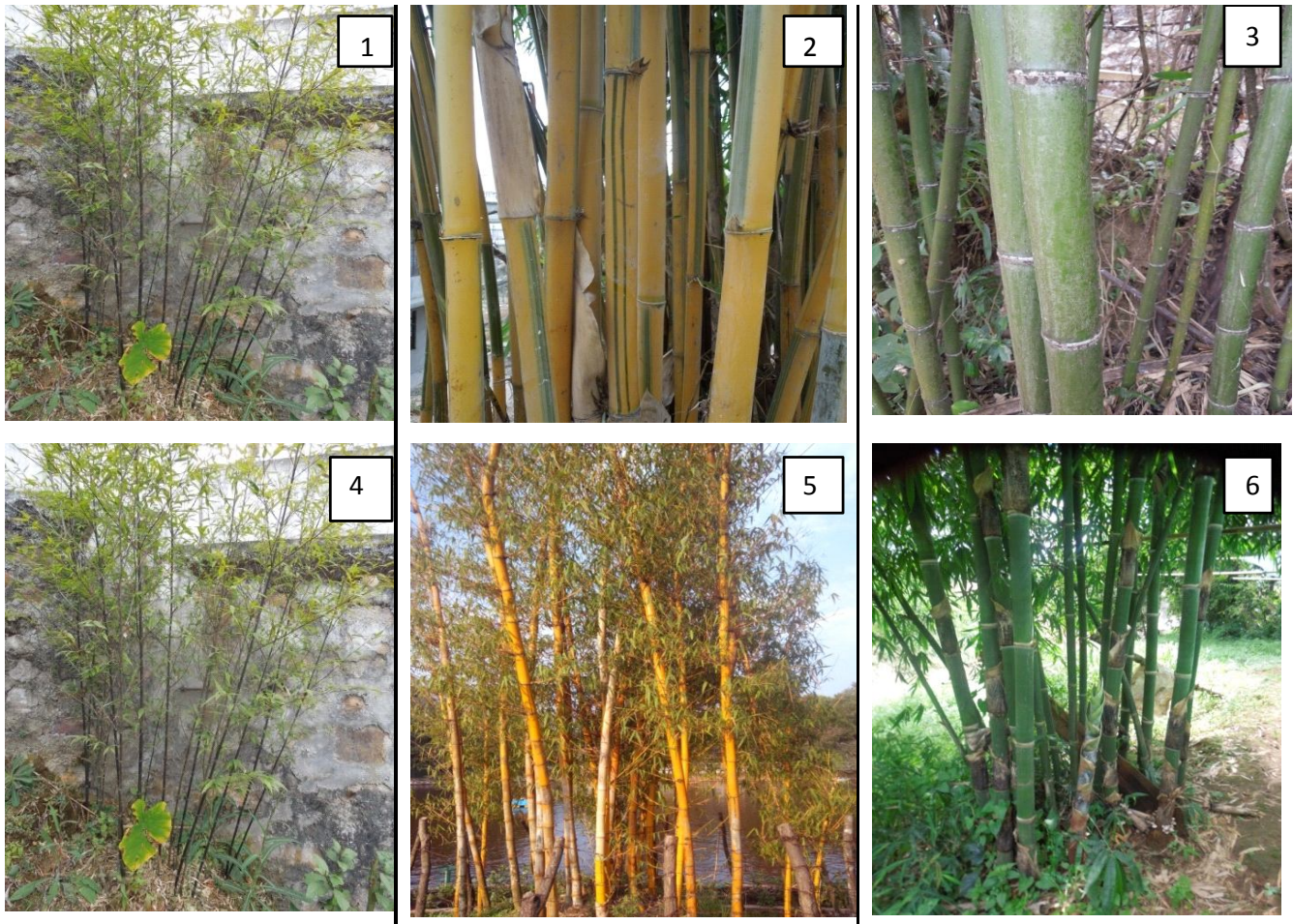


Fig. 2: 1. *Phyllostachys nigra* (Lodd. Ex Lindl.); 2. *Bambusa vulgaris* var. *vittata* Riviere & C. Riviere; 3. *Phyllostachys mannii* Gamble; 4. *Dendrocalamus giganteus* Munro; 5. *Bambusa vulgaris* var. *vulgaris* Schrad. ex Wendl. 6. *Dendrocalamus hookeri* Munro.

Table 1: Bamboo species of Meghalaya and their distribution.

Species	Vernacular name	Distribution
Bambusa		
<i>Bambusa balcooa</i> Roxb	Wahiong (K) Beru, Borua	K, J & G
<i>Bambusa bambos</i> (Linn.) Voss	Wahkanteh (G)	K & G
<i>Bambusa cacharensis</i> R.B Majumdar	Ba (J)	K & J
<i>Bambusa jaintiana</i> R.B.Majumdar	U shken (K), wathibok (G)	K, J & G
<i>Bambusa mohanramii</i> P.Kumari & P. Singh	Seij (J)	K & J
<i>Bambusa multiplex</i> (Lour.) Raeusch	-	K
<i>Bambusa pallida</i> Munro	Skhein, u sken (K), Wago (G)	K, J & G
<i>Bambusa polymorpha</i> Munro	-	K
<i>Bambusa tulda</i> Roxb.	Wati (G)Thengrangai (J), Rnai	K, J & G
<i>Bambusa vulgaris</i> var. <i>vittata</i> Riviere & C. Riviere	Siej stem (K)	K
<i>Bambusa vulgaris</i> var. <i>vulgaris</i> Schrad. ex Wendl.	Wamannah (G), Shken shilot (J)	K, J & G
Cephalostachyum		
<i>Cephalostachyum capitatum</i> Munro	Ternap (K)	K
Chimonobambusa		
<i>Chimonobambusa callosa</i> (Munro)	U Skong, U Spar (K)	K
<i>Chimonobambusa quadrangularis</i> (Franseschi) Makino	U Spar bah (K)	K
Chimonocalamus		
<i>Chimonocalamus griffithianus</i> (Munro) J.R. Xue & T.P.Yi	U Spar iong (K)	K & J
Dendrocalamus		
<i>Dendrocalamus giganteus</i> Munro	U Ktang (K)	K
<i>Dendrocalamus hamiltonii</i> Nees & Arn. Ex Munro	Wanoke (G), Siej heh (K)	K, J & G
<i>Dendrocalamus hookeri</i> Munro	Siej iong, Seij sai, U ktang (K)	K
<i>Dendrocalamus longispathus</i> Kurz		K
Drepanostachyum		
<i>Drepanostachyum suberectum</i> (Munro) R.B. Majumdar	Nam-iong (K) Lom bnag (J)	K & J
Gigantochloa		
<i>Gigantochloa albociliata</i> Kurz	-	K & G
Melocanna		
<i>Melocanna baccifera</i> (Roxb.) Kurz	Watrai (G), Tyrlaw (K)	K & G
Neomicrocalamus		
<i>Neomicrocalamus prainii</i> (Gamble)	Beneng (J)	K & J
Phyllostachys		
<i>Phyllostachys mannii</i> Gamble	Shken, Siej Naga, Siej Naka,(K)	K & J
<i>Phyllostachys nigra</i> (Lodd. Ex Lindl.)	Naka iong (K)	K
Pleioblastus		
<i>Pleioblastus viride-striatus</i> (Regel)	-	K
Pseudosasa		
<i>Pseudosasa japonica</i> (Sieb & Zucc. ex Steud)	-	K
Schizostachyum		
<i>Schizostachyum helferi</i> (Munro)	Wati (G), Tuma (J), Tmar (K)	K, J & G
<i>Schizostachyum mannii</i> R.B. Majumdar	-	K & J
Yushania		
<i>Yushania nutakayamensis</i> (Hayata)	-	K

Table 2: Uses of bamboo species found in Meghalaya.

Species name	Construction	Food	Handicrafts	Ornamental	Fodder
<i>Bambusa balcooa</i>	+	-	+	-	+
<i>Bambusa bambos</i>	+	-	+	-	-
<i>Bambusa cacharensis</i>	+	-	+	-	+
<i>Bambusa jaintiana</i>	+	+	+	-	+
<i>Bambusa multiplex</i>	+	-	+	+	-
<i>Bambusa pallida</i>	+	-	+	-	-
<i>Bambusa polymorpha</i>	+	-	+	+	-
<i>Bambusa tulda</i>	+	-	+	-	-
<i>Bambusa vulgaris</i> var. <i>vulgaris</i>	-	-	+	+	-
<i>Bambusa vulgaris</i> var. <i>vittata</i>	-	-	+	+	-
<i>Chimonobambusa callosa</i>	-	-	+	-	-
<i>Dendrocalamus hamiltonii</i>	+	+	+	-	+
<i>Dendrocalamus hookeri</i>	+	+	+	-	-
<i>Dendrocalamus longispathus</i>	+	+	+	-	+
<i>Gigantochloa albociliata</i>	+	-	+	-	-
<i>Melocanna baccifera</i>	+	+	+	-	-
<i>Neomicrocalamus prainii</i>	-	-	+	-	-
<i>Phyllostachys mannii</i>	+	+	+	-	+
<i>Phyllostachys nigra</i>	-	-	-	+	-
<i>Pseudosasa japonica</i>	-	-	-	+	-
<i>Schizostachyum helferi</i>	-	-	+	-	-
<i>Schizostachyum mannii</i>	-	-	+	-	-



Fig. 3: Bamboo used for various purposes: 1. Winnowing tray 2. Basket 3. Small basket 4. Round winnowing tray 5. Bamboo house 6. Bamboo ladder 7. Water pipe 8. Fencing bamboo.

Table 3: Traditional bamboo products commonly manufactured by bamboo craftsmen with its market price.

Items	Local name	Market price
Bamboo stool	Mula	Rs 200-300
Bamboo shoot	Lungsiej	Rs 80-100 per bundle
Basket	Shang	Rs 150-250
Basket	Polo	Rs 100-200
Bamboo bag for carrying swords	Ruh wait	Rs 100-150
Bow and arrow	Khnam	Rs 200-300
Broom	Synsar mator	Rs 20-50
Cone basket	Khoh	Rs 100-200
Fish trap	Ruh khnam	Rs 100-150
Fishing trap	Kriah tong doh	Rs 80-150
Fish container	Rymwiang khwai	Rs 100-150
Fishing rod	Kriah thep doh	Rs 500-1500
Khasi comb	Snat	Rs 20-40
Khasi Flute	Besli	Rs 500/Piece
Khasi musical mouthpiece	Mieng	Rs 300-400
Kite	Kot kudi	Rs 10-20
Poultry basket	Khoh Syiar	Rs 150-300
Water pipes	Pipe um	Rs 20-50
Winnowing tray	Prah	Rs 200-400

The species that have been found commonly in the three regions are like *Bambusa balcooa* Roxb, *Bambusa jaintiana* R. B. Majumdar, *Bambusa pallida* Munro, *Bambusa tulda* Roxb., *Bambusa vulgaris* Schrad., *Dendrocalamus hamiltonii* Nees & Arn. ex Munro and *Neohouzeaua helferi* (Munro) Gamble. Moreover, different uses of bamboo such as for construction, food, handicrafts, ornamental and as fodder for animals have also been listed (Table 2). Among the total species *Bambusa jaintiana*, *Dendrocalamus hamiltonii*, *Dendrocalamus longispatus* and *Phyllostachys mannii* have the maximum utility, whereas *Phyllostachys nigra*, *Pseudosasa japonica*, *Schizostachyum helferi* and *Schizostachyum mannii* are found to have very less utility. The uses of bamboo species by the indigenous people for all the above mention purposes are almost similar with most of the northeastern state of India (Tamang et al. 2013 & Rajkumari & Gupta, 2013). The uses of bamboo for different craft products with its market price is also been discussed in the study for better and sustainable uses of the species (Table 3).

Conclusion

Bamboo belonging to Poaceae family which forms the tribe Bambuseae, of the subfamily, Bambusoideae is widely distributed throughout the state. The study generated shows the diversity of bamboo species out of which 30 species has been collected which are of conservational importance to the indigenous people of

Meghalaya. The uses of bamboos in this area continue to be traditional and therefore it is an important commodity in our life. Thus the people of Meghalaya should make an effort to make the bamboo sector an important contributor in our state and proper management strategies should be developed for their conservation.

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