

Observations on the culms of *Melocanna baccifera* in Kolasib Division, Mizoram, India

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Abstract—This paper compares the culms of *Melocanna baccifera* in forest and plantation sites, and reports about the effects on the number of culms, their health, the girth, the height, the internode length and the production of new culms.

Key words: *Melocanna baccifera*; forest; plantation; comparative study.

INTRODUCTION

The study area is located in Kolasib Division in the State of Mizoram (India) with a latitude of 14° N to 24° 15' N and longitude 92° 30' E to 92° 45' E. It occupies a total area of 1658 sq. km. with an altitude ranging from 40 metres to 1500 m a.s.l. The forest cover is both primary and secondary type, comprising tropical and sub-tropical type. Bamboo occupies the lower storey in the climax stage in the riverside forest and depressions. In the degraded jhum land bamboo species emerge as a secondary crop. The most dominant and common bamboo species is *Melocanna baccifera* with a few clumps of *Bambusa* and *Dendrocalamus* species.

Bamboo takes an important place in the tribal society; 20 species have been reported growing in Mizoram [1]. *Melocanna baccifera* is a non-clump-type bamboo. This species has a net-like extensive rhizome system and might have been naturally selected in the region for protecting the forest site from erosion [2].

STUDY AREA

The area has a moderate climate due to its tropical location, it is neither hot nor too cold throughout the year. The region falls under the southwest monsoon, so it receives an adequate amount of rainfall. The climate is humid, tropical, characterised by short winter and summer with heavy rainfall mainly from May to

September and lasting until late October. Normally July and August are the wettest months while December and January are the driest months [3]. The cold season starts in November and lasts until February, when the temperature is comparatively lower (11–25°C); the warm season begins in March and lasts until the first part of May with a temperature of 19–29°C.

The soil is generally young, immature and sandy. The surface soils are dark, highly leached and poor in bases, rich in iron, having lower PH values ranging from 4.5 to 5.5, which is in the acidic range. They are well drained and high in potash. The texture is loam to clay loam. The percentages of clay, silt and sand are 15–30%, 35–45% and 25–45%, respectively [4].

METHODOLOGY

For conducting the study experimental plots of 20 m by 20 m have been laid at random throughout the forest compartments and in the plantation site. The plots were designed so as to study at least 20% culms in each compartment. Inside the experimental plots, all the bamboo culms were studied and the following measurements taken and average values calculated: the number of culms, of diseased, dead and dry culms, of bent and broken culms, of first-year culms, of second-year culms, and of matured culms; the average height of the culm; the distribution of culms according to girth class and the average length of the internode.

The study used the next features for identifying different year culms.

- First-year culm: colour green, culm sheath confined only to lower nodes, no leafy branches.
- Second-year culm: colour green, culm sheath confined only to lower nodes, branches toward the upper nodes.
- Matured culms: culm sheath absent, branches confined to the upper one third of the culm.

Plots were laid in compartment 1 (forest site), compartment 2 (forest site) and compartment 3 (plantation site). The measurements recorded culms in all three compartments.

The field observations were recorded from the months of April 2000 to May 2001. After recording the measurements the average was calculated for the experimental plots, and later on for the compartment as a whole, and percentages were calculated. Girths of the culms were measured on the second internode at a distance of 5 cm above the node.

RESULTS AND CONCLUSIONS

The number of unhealthy and healthy culms in forest and plantation site recorded at the end of the study is given in Table 1. The overall pattern was analysed by

Table 1.

Effect on the condition of culms

Compartment	Area (acre)	No. of culms counted	Dead culms	Broken culms	Total unhealthy culms	Healthy culms
Forest 1	1.8	850	6% (55)	7% (62)	13% (117)	87% (733)
Forest 2	1.5	735	8% (59)	9% (66)	17% (125)	83% (610)
Mean	1.65	792	7%	8%	15%	85%
Plantation	1.4	650	2% (13)	3% (19)	5% (32)	95% (617)

The numbers between brackets are the numbers of culms.

Table 2.

Effect on the girth of culms

Compartment	1–3 cm	3.1–5 cm	>5.1 cm
Forest 1	39% (328)	53% (450)	8% (733)
Forest 2	36% (265)	51% (375)	13% (95)
Mean	37.5%	52%	10.5%
Plantation	45% (292)	45% (292)	10% (65)

The numbers between brackets are the numbers of culms.

Table 3.

Effects on height of culm and length of internode

Compartment	No. of culms	Average height in m	Average length of Internode in cm
Forest 1	850	13	27
Forest 2	735	14	28
Mean	792	13.5	27.5
Plantation	650	16	32

applying a 2×2 matrix (forest and plantation site *vs.* unhealthy and healthy culms). A chi-square analysis revealed a significant difference between plantation and forest site.

The number of different sizes of girth in forest and plantation sites recorded at the end of the study is given in Table 2. The overall pattern was analysed by applying a 2×3 matrix (forest and plantation site *vs.* 1–3 cm, 3.1–5 cm, >5.1 cm size). A chi-square analysis revealed no significant impact on the girth of the culms.

The mean height and the mean length of internodes in forest and in plantation site recorded at the end of the study are given in Table 3. The result in Table 3 indicates that the mean length of culm and the mean length of internode in forest site were less compared to the plantation site.

Table 4.

Effect on new culm production

Compartment	% of 1st year culms	% of 2nd year culms	% of mature culms
Forest 1	24% (240)	26% (221)	50% (425)
Forest 2	26% (191)	28% (206)	46% (338)
Mean	15%	27%	48%
Plantation	32% (208)	30% (195)	38% (247)

The numbers between brackets are the numbers of culms.

The number of different years culms in forest and plantation recorded at the end of the study is given in Table 4. The overall pattern was analysed with a 2×3 matrix (forest and plantation site vs. 1st year, 2nd year, matured culms). A chi-square analysis revealed a significant difference between forest site and plantation. There is not much difference in culms between the forest and plantation site.

Mizoram has vast bamboo resources in comparison with other states of the North-Eastern Region. Kolasib Division contributes the major share [5]. The observations are of great value for the bamboo management of the species.

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