



# FACTORS INFLUENCING *IN VITRO* REGENERATION OF BAMBOOS (*BAMBUSA BALCOOA* ROXB. AND *BAMBUSA TULDA* ROXB.) FOR RAPID MASS CLONAL PROPAGATIONS OF HIGH-QUALITY PLANTING MATERIALS IN AGROCLIMATIC CONDITION OF BIHAR

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**ABSTRACT:** *Bambusa balcooa* and *Bambusa tulda* are fast growing perennial bamboos, which are the natural raw materials for thousands of biodegradable products. In the present investigation, protocol has been developed for aseptic culture establishment of both the species of bamboos with high efficiency of rooting and standardization of hardening processes. The influence of various critical factors influencing *In vitro* micropropagation and also the comparative measures to overcome those factors under laboratory conditions have been evaluated. MS basal (solid and liquid) media supplemented with various combinations of hormones and additives were applied. The per cent of bud proliferation, number of shoots, shoot length, multiplication and rooting at different phytohormonal concentrations were observed. One way analysis of variance (ANOVA) was made and the significant differences between Means were determined by DMRT at  $p \geq 0.05$ . In case of *B. balcooa* synergistic effect of phytohormones BAP (1mg/L) and NAA (0.1mg/L) with additives in liquid media resulted 100% bud breakage, while in case of *B. tulda* the highest percentage (100%) of bud breakage was recorded in BAP (1mg/L) without additives. *B. balcooa* sub cultured in medium containing NAA 2.5 mg/L along with half strength of MS resulted 98% rooting. Whereas, in case of *B. tulda* full strength of MS medium supplemented with (5mg/L NAA) had 99.8% root induction. Survival percentage in primary hardening was high during monsoons in the potting mixture of cocopit : vermicompost (2:1). Mass clonal propagation (true to the type) of high-quality germplasm can boost up the economy of rural areas as well as can help to maintain the environmental sustainability.

**Keywords:** ANOVA test, *Bambusa balcooa*, *Bambusa tulda*, BAP, IBA, *In vitro* regeneration, Micropropagation, NAA.

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## INTRODUCTION

Bamboos are green, versatile, perennial highly evolved angiospermic plants belonging to the grass family, Poaceae. They are one of the fastest growing plants on the earth and are also known as green renewable natural resources. They absorb five times more CO<sub>2</sub> and produce 35% more oxygen compared to other similar sized plants (Nasreen *et al.*, 2015, Choudhary *et al.*, 2017). They are non-wood forest plants and are also

substitute to timbers with tremendous socio-ecological, commercial and cultural significance to human civilization. Bamboo has special place in the lives of rural areas especially in North East India. There are around 1200 species of bamboos occurring worldwide, which have more than 1500 documented uses from cradle to coffin, scaffolding, paper pulp, construction, agricultural implements, furniture, fishing rod etc. (Chakraborty, 1988, Tewari, 1994, Singh *et al.*, 2021).