ORIGINAL ARTICLE Open Access

ISSN 2278-1404

International Journal of Fundamental & Applied Sciences

Incidence of synchronous sporadic flowering of four different species of bamboos in Kokrajhar District, BTAD, Assam, India

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Manuscript received 5th March, 2017, revised 21st Aug 2017, accepted 1st Sept, 2017

Abstract

The successive generation continues in angiosperm through flowering. The parent plants of some of the members that belongs to Poaceae family dies after flowering.A member of the sub-family Bambusoideae of Poaceae, bamboos, exhibit similar characteristics. In this paper an attempt have been made to document the incidence of flowering of bamboo in Kokrajhar district of BTAD, Assam. Four bamboo species viz. *Bambusa assamica*, *Bambusa tulda*, *Dendrocalamus hamiltonii* and *Melocanna baccifera* belonging to three different genera were recorded to flower sporadically during March-May 2015 at Chandrapara, Odlaguri, Baukhungri hills, Chandrapara respectively. All the recorded species were semelparous i.e. the life cycle of the plant ends with flowering. Thus if the flowering continues in the same frequency the time may come in near future when this invaluable natural resource might become endangered or even extinct. Thus, this is the need of the hour to apply biotechnological tools and develop protocols for propagation and conservation and thus, save this green gold from germplasm erosion

Keywords: Bamboo, *Bambusa tulda*, *Dendrocalamus hamiltonii*, *Melocanna baccifera*, *Bambusa assamica*, sporadic flowering

1. Introduction

Bamboo is the name given to a group of perennial evergreen plants belonging to the grass family Poaceae (Goyal et al., 2010). Previously this group of grasses was recognised as a tribe Bambuseae Kunth but this could not stand the taste of time and was replaced by the subfamily Bambusoideae Nees. Bamboos are monocarpic having an unusual flowering cycle. Before engaging in a suicidal bout of sexual reproduction they remain in vegetative state for decades (Janzen, 1976). In almost all the plants it is the environmental factors that play an important role in the growth and flowering. The factors that trigger flowering in bamboo are still a botanical enigma (Ramanayake, 2006). Review of literature showed that till date no attempt have been made to document the incidence of flowering of bamboo in Kokrajhar district, BTAD, Assam though it is rich in bamboo biodiversity (Brahma et al., 2014). Thus, the present study deals with the documentation of flowering of four species of bamboos *viz*. *Bambusa tulda*, *Bambusa assamica*, *Dendrocalamus hamiltonii* and *Melocanna baccifera* belonging to three different genus.

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2. Materials and Methods

2.1 Study Area

The present survey was conducted in one of the four Districts of the Bodoland Territorial Area Districts (BTAD) a landlocked territory in Assam between Bhutan, West Bengal and Arunachal Pradesh. The total geographic area of the studied Kokrajhar district is estimated to be 3,169 Km^2 of which 1,144 Km^2 is under forest cover (FSI, 2011). The climate of the district is humid sub-tropical in nature characterized by warm-humid summer and cool-dry winter.

2.2 Methodology

Field visits were conducted at several places covering the entire Kokrajhar district to observe the natural strands of bamboo for documenting the incidence of flowering during January to June 2015. Initially random walk in the

Figure I: Flowering clump of different bamboo species bearing inflorescence. (A&B) *Dendrocalamus hamiltonii*, C: *Melocanna baccifera*, D: *Bambusa assamica* and E&F: *Bambusa tulda*

forests and hills was opted for sampling and later regular interval was maintained to have fixed sampling intensity for the study (Goyal et al., 2012). Elaborate notes were made on different aspects of the bamboo clump for authentic identification of the species. In addition to this photographs and the flowering culm bearing inflorescence were also collected and preserved at Centre for Bamboo Studies, Bodoland University, Kokrajhar, Bodoland Territorial Administrative Districts, Assam.

3. Results and discussion

At the onset of rejuvenating Spring during April 2015, the first incidence of sporadic flowering of bamboo was noted at Baukhungri Hills falling within the Chakrashila Wildlife Sanctuary and tucked away 10 kms east of Kokrajhar town located at 26˚20' latitude and 90˚19' longitude. The species was identified as *Dendrocalamus hamiltonii* Munro. locally known as Kekowa banh (*Assamese*) and Owa Khangkhua (*Bodo*) (Fig 1A and 1B). Two clumps were recorded to flower one at 1650 ft and other at 1800 ft above sea level. All the culms in the clump flowered leading to the death of the entire clump. However, no seeds were recorded. *D. hamiltonii* exhibits both gregarious and sporadic flowering with the flowering cycle of 30-40 years (Seethalakshmi and Kumar, 1998). Though the species usually flowers sporadically annually but this event was noticed for the first time in Kokrajhar District. In the last two decades gregarious flowering has been encountered in many places of upper Assam and also Dhubri adjoining the Kokrajhar District (Barooah, 1999).

The sporadic flowering of *Meloccana baccifera* (Roxb.) Kurz locally named as Owa Thorai (*Bodo*) and Muli banh (*Assamese*) was located in Chandrapara of Kokrajhar District (26˚4' latitude and 90˚266' longitude) during April, 2015. All the culms housed within the same rhizome system (Sympodial, non-clump) flowered and set large sized pear shaped seeds (Fig 1C). *M. baccifera* flowers overwhelmingly gregariously and rarely sporadic. The flowering in Muli bamboo usually occur in three phases: preliminary or initial sporadic flowering, gregarious flowering and final sporadic flowering of the left over clumps (Banik, 2010).

Bambusa assamica Barooah et Borthakur referred to as Owa There (*Bodo*) and Saru Bijuli (*Assamese*) was also located to flower sporadically during March-April, 2015 in Chandrapara like *M. baccifera* (Fig 1D). As per our knowledge till date there is no record on the flowering of this bamboo species.

Popular locally as Owa Gubwai (*Bodo*) and Jati banh (*Assamese*), *Bambusa tulda* Roxb. happened to flower sporadically in Odlaguri (26˚29' latitude and 90˚18' longitude), a place about 18 kms from Kokrajhar town during May, 2015 (Fig 1E and 1F). Similar to *D. hamitonii* here also both the clump flowered and simultaneously died but, unlike *D. hamiltonii* they produced seeds. However, gregarious flowering is considered to be the usual event in *B. tulda*, therefore the sporadic flowering recorded in the present study seems to be significant. In Assam, sporadic flowering of *B. tulda* was recorded in 1997 in two different localities viz. Dhemaji and Lakhimpur (Barooah, 1999).

4. Conclusion

Like most other bamboo species, all the four species recorded in the present study were semelparous, i.e. the life cycle of the plant ends with flowering. Thus, if the flowering continues in the same frequency the time may come in near future when this invaluable natural resource might become endangered or even extinct. Thus, this is the need of the hour to apply biotechnological tools and develop protocols for propagation and conservation and thus save this green gold form germplasm erosion.

Acknowledgement

The authors are thankful to the Agriculture Department, Bodoland Territorial Council Secretariat, Bodofa Nwgwr, Kokrajhar for financial assistance. Thanks are also due to Mr. Jagajit Brahma, Ms. Bijanta Bala Brahma and Mr Karma Goyari, laboratory attendant and field attendant during field work.

Conflict of interest

Authors declare none

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