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Research Article

Preliminary report on the sporadic flowering of *Dendrocalamus hamiltonii* Ness and Arn. Ex Munro in Kalimpong district of West Bengal, India

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Abstract

A Sporadic flowering in bamboos, particularly in species such as *Dendrocalamus hamiltonii*, poses significant ecological and economic implications. This short communication reports the recent observations of sporadic flowering events of *D. hamiltonii* in the Kalimpong district of West Bengal. The study aims to document the occurrence, potential causes, and impacts of these flowering events on local bamboo populations and associated communities.

Keywords: *Dendrocalamus hamiltonii*, Flowering culm, Flowering history, Sporadic flowering

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Introduction

Dendrocalamus hamiltonii Ness and Arn ex Munro, commonly known as Hamilton's bamboo and in local Nepali vernacular it is called Choya Bans, is a significant species in the landscapes of Kalimpong, West Bengal. It is a deciduous bamboo species that typically grows at elevations up to 1200 m. This is a huge, tightly clumped bamboo. It occasionally grows tall and straight, but more commonly it sends out its branches at an angle or bent in a downward direction (Banik, 2000; Rao and Ramakrishnan, 1987). Culms typically reach heights of 18-20 m, or even up to 26 m, with diameters of 9–18.5 cm. They are typically bare below and heavily branch above. Occasionally, the branches resemble a whole plant. Root scars are present on the 30–50 cm long, 1.25 cm thick wall of the nodes (Banik, 2000). Those of the lower portion of the huge culm are long and rigid, varying in size from 34 to 46 cm long and roughly 19 cm broad.

In humid tropical regions and some areas of the Montane subtropical zone, it frequently makes up the main vegetation. It is one of the most economically significant species in south and southeast Asia. It is used to make pulp, paper, and rayon, as well as building materials such scaffolding, fencing, ceilings, walls, native houses, fuel, handicrafts, and floats for timber rafts (Rao et al., 1998). According to Wang et al. (2002), the young shoots are edible, and the stalks can also be used as medicine to treat food poisoning and fever.

The *Dendrocalamus hamiltonii* exhibits both sporadic and gregarious flowering patterns, with the latter occurring after a vegetative phase lasting 30-40 years (Gupta, 1972; Varmah and Bahadur, 1980). Unlike gregarious flowering, sporadic flowering in bamboos is less understood and can lead to localized ecological changes. The flowering history of *D. hamiltonii* in India is summarised in table 1.

Considering the above background, the present study seeks to:

1. Record and examine the recent instances of sporadic flowering of *Dendrocalamus hamiltonii* in the Kalimpong district of West Bengal.
2. Generate baseline information to support long-term monitoring and conservation initiatives for bamboo species in the Eastern Himalayas.
3. Evaluate the morphological traits and environmental conditions linked to flowering culms observed in study areas.

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Table 1. The flowering history of *D. hamiltonii* in India

Species Name	Period	Nature of flowering	Place	Reference
Dendrocalamus hamiltonii	1894	Gregarious	Sikkim and Dehradun	Gambel, 1896
	1905	-	Lakhimpur, Assam	Cavendish, 1905
	1910, 1911 and 1914	-	Northern part of Khasi Hills	Troup, 1921
	1972	Gregarious	Assam	Gupta, 1972
	1976	Gregarious	North-West Bengal	CF, 1976
	1987	Sporadic	Cachar, Assam	Gupta, 1987
	1989-1990	Gregarious	Darjeeling Hills, North Bengal,	Sahoo, 1991
	1996-1998	Gregarious	Lakhimpur, Morigaon and Dhubri, Assam	Barooah, 1999
	1997-1998	Gregarious	Mizoram	Bisht and Naithani, 2010
	2001-2002 and 2004	Sporadic	Mizoram	NMBA, 2009
	2003-2004	Sporadic	Nagaland	NMBA, 2009
	2006-2007	Gregarious	Mizoram	Bisht and Naithani, 2010
	2008-2009	Gregarious	Subansiri district and Koloriang district and West Siang district	Taj et al., 2009
	2012	Gregarious	Palin (Kurung Kumey district), Lower Subansari and Bokhana, Mara and Taliha in Upper Subansari (Arunachal Pradesh)	Naithani et al., 2013

Materials and Methods

Field surveys were conducted in various parts of the Kalimpong district, West Bengal, between January 2023 and March 2024 to study the flowering patterns of *Dendrocalamus hamiltonii*. Information on flowering occurrences was collected through direct field observations, local inquiries, and reports from forest officials. The survey sites included forest areas and bamboo groves adjacent to agricultural lands.

Geographical coordinates were recorded using a handheld GPS device. Flowering specimens were photographed and examined for morphological characteristics, including inflorescence structure, color, and arrangement. The sites of Pedong (27.1594° N, 88.6157° E), Algarah (27.1172° N, 88.5837° E), and Loleygaon (27.0206° N, 88.5650° E) were selected for detailed documentation.

Results and Discussion

Instances of sporadic flowering in *D. hamiltonii* were observed across multiple sites in the Kalimpong district. The flowering bamboo clumps were scattered and did not exhibit a uniform flowering pattern, suggesting a sporadic rather than

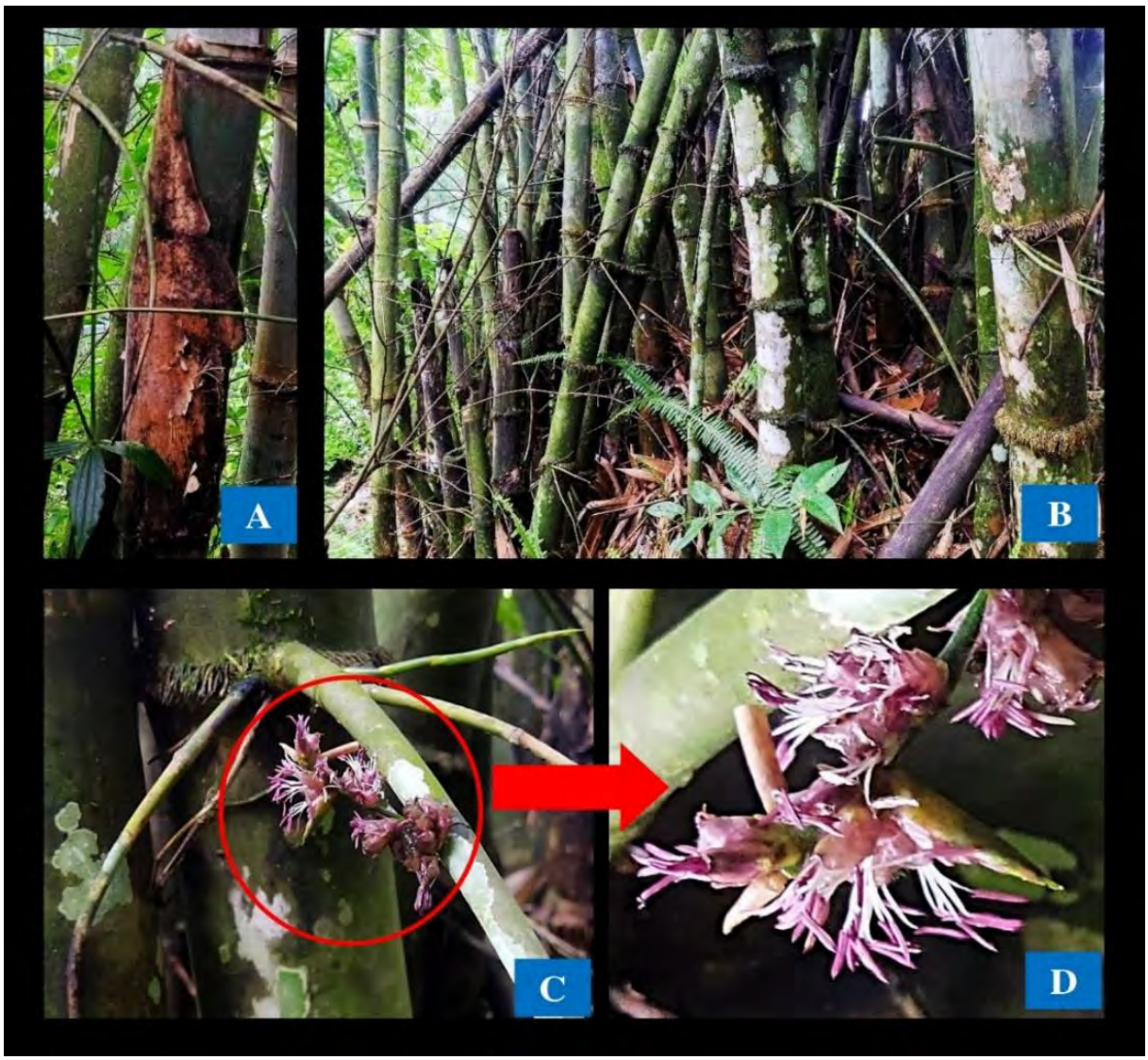

Figure 1. Different stages of *Dendrocalamus hamiltoniii* in anthesis. (A) Culm with culm sheath (B) Culms in vegetative stage (C) Culm bearing flowering branch and (D) Inflorescence in closeup.

gregarious event. Flowering was characterized by the emergence of inflorescences from mature culms, with flowers appearing pale light pinkish when young, turning yellowish at maturity, and arranged in clusters, typical of the species (Fig. 1).

The flowering events coincided with a period of unseasonal rains and temperature fluctuations, implying that climatic anomalies could act as potential triggers for sporadic flowering. Similar observations have been noted elsewhere (Gupta, 1972; Bisht and Naithani, 2010).

Sporadic flowering in bamboo species has significant ecological and socioeconomic implications (Bantawa and Rai, 2025). Firstly, flowering is typically followed by seed formation and culm death, which can lead to a temporary reduction in bamboo cover. This may adversely affect wildlife dependent on bamboo for food and shelter. Secondly, *D. hamiltonii* forms an important livelihood resource for local communities in Kalimpong, providing material for construction, handicrafts, and household use. The die-back following flowering events may reduce bamboo availability, creating an urgent need for sustainable management and regeneration practices.

Furthermore, while the exact triggers of sporadic flowering in *D. hamiltonii* remain uncertain, climate change-related factors—such as irregular rainfall, temperature shifts, and soil moisture fluctuations—may influence phenological behaviour. Long-term monitoring and correlation studies are essential to confirm these hypotheses.

Conclusion

The documentation of sporadic flowering of *Dendrocalamus hamiltonii* in the Kalimpong district adds valuable insight into the species' phenological behaviour in Eastern Himalaya. The observed events underline the importance of continuous monitoring,

ecological research, and community-based management for bamboo resources. Understanding the environmental and genetic triggers of flowering can help in developing adaptive conservation strategies, ensuring both ecosystem stability and sustainable livelihood support for local populations.

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