

A note on some deviating pollen morphological features in four species of *Bauhinia* (Leguminosae: Caesalpinioideae) from the sub-Himalayan West Bengal, India

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ABSTRACT

The pollen morphology of four species of the genus *Bauhinia* L. (Leguminosae: Caesalpinioideae) namely *Bauhinia acuminata*, *B. malabarica*, *B. tomentosa* and *B. vahlii* from the sub-Himalayan region of West Bengal were examined using light and scanning electron microscopes. The study revealed some pollen morphological characters (both aperture and exine ornamentation) deviating from the previously reported attributes.

Key-words: *Bauhinia* L., pollen morphology, LM, SEM.

INTRODUCTION

Bauhinia L. is a large pantropical genus having more than 300 species (Wunderlin et al. 1987) of Caesalpinioideae of Leguminosae. The pollen morphology of different species of *Bauhinia* has been investigated by different workers throughout the globe (Schmitz 1973; Ferguson & Pearce 1986; Tidke et al. 2012; Santos et al. 2012; Moreira et al. 2013). In India, Vishnu-Mittre & Sharma (1962) worked out the pollen morphology of 19 species. Subsequently, Bandopadhyay & Sharma (1993) also studied the pollen morphology of some species of *Bauhinia*. Recently while investigating the arboreal pollen flora of the sub-Himalayan West Bengal, India the authors have come across some pollen morphological characters that

differed from earlier reported ones in four species of *Bauhinia* which have been presented in this brief communication. The sub-Himalayan region of West Bengal is commonly known as Terai (25° 57" to 26° 36" N and 89° 54" to 88° 47" E) and Dooars (26° 16" to 27° 0" N and 88° 4" to 89° 53" E) under the districts Darjeeling, Jalpaiguri and Alipurduar. This region falls under the IUCN recognized "Himalaya Biodiversity Hotspot" (Conservation International 2013).

MATERIAL AND METHODS

Pollen grains were procured from ripe anthers of mature flower buds/ partially opened flowers of *B. acuminata* L. (voucher no. Baishakhi & A.P. Das_0042, local name: *Swet-Kanchan*, place of

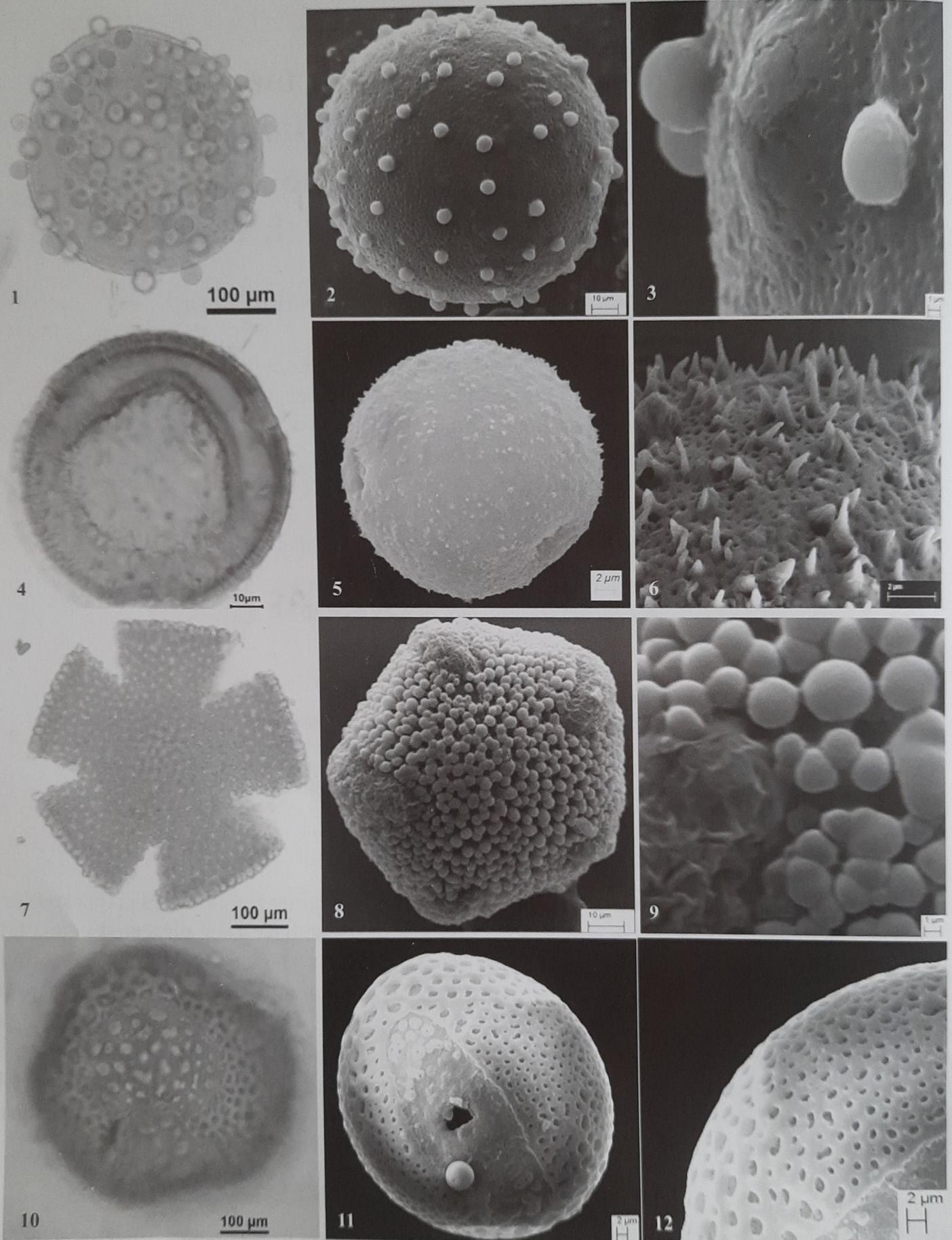


PLATE 1

Figs 1, 2 & 3. LM & SEM photographs of pollen grains of *B. acuminata*. Figs 4, 5 & 6. *B. malabarica*, 7, 8 & 9. *B. tomentosa* Figs 10, 11 & 12. *B. vahlii* 22

Table 1: The pollen morphological features of the four studied species of *Bauhinia* L. from sub-Himalayan West Bengal

Species	Aperture Condition	Amb.	Shape	Grain Size (μm) P x E	Colpus (μm)		Ora (μm)		Exine	characters noted in the current study	Characters noted in the previous study
					Length	Width	Length	Width			
<i>B. acuminata</i>	Inaperturate	Circular	Spheroidal	110.06 x 110.06	-	-	-	-	Sub-TECTATE, perforate with supratectal gemma, exine 2.60 μm thick	Inaperturate	Nair and Sharma (1962), and Tidke <i>et al.</i> (2012) reported the presence of aperture in <i>B. acuminata</i> pollens
<i>B. malabarica</i>	Triporate	Circular	Spheroidal	38.23 x 38.23	-	-	5.45	5.45	Sub-TECTATE, perforate, with supra-TECTAL spinules, sexine thicker than nexine, exine 2.36 μm thick	Sub-TECTATE, tectum perforate, with supra-TECTAL spinules	Vishnu-Mittre and Sharma (1962) reported baculate and non-tegillate exine
<i>B. tomentosa</i>	Polycolpate	Circular, lobed	Spheroidal	89.31 x 89.31	70.2	7.02	-	-	sexine sub-TECTATE, reticulate, with supratectal clavae, exine 5.60 μm thick	Polycolpate apertures and with supratectal clavate ornamentation	Vishnu-Mittre and Sharma (1962) described the pollen as inaperturate with verrucose ornamentation Banks <i>et al.</i> (2013) reported 3-colporate and striate grains
<i>B. vahlii</i>	Tricolporate	Circular to triangular	Prolate-spheroidal sub-prolate	58.5 x 53.04	42.12	16.77	8.97	6.24	sexine sub-TECTATE, foveolate, foveal depression with rare occurrence of ornamentation, lumina smaller towards the margin of the aperture, sexine is thicker than nexine, exine 3.67 μm thick	Foveolate ornamentation with tectal lumens of different shapes	Vishnu-Mittre and Sharma (1962), Nair and Sharma (1962) reported reticulate exine ornamentation

collection: Sukna), *B. malabarica* Roxb. (voucher no. Baishakhi & A.P. Das_0450, local name: *Karmai*, place of collection: Baikunthapur Forest), *B. tomentosa* L. (voucher no. Baishakhi & A.P. Das_0280, local name: *Holudkanchan*, place of collection: Jalpaiguri) and *B. vahlii* Wight & Arn. (voucher no. Baishakhi & A.P. Das_0446, local name: *Sialpatta*, place of collection: Sevoke). Voucher specimens were prepared and mounted on herbarium sheets following conventional methods (Jain & Rao 1977), identified by comparing with the herbarium specimens kept at the Calcutta

University Herbarium (CUH). Polliniferous materials were acetolysed following Erdtman (1960) for studying under Light microscopy (LM) and scanning electron microscopy (SEM). For the descriptive terminology of pollen grains Erdtman (1952, 1960, and 1969), Kremp (1965) and Faegri *et al.* (1964) were followed.

RESULTS

The current study revealed some characters in the pollen grains that differ from earlier reported works. We have noted absence of any aperture, (i.e.

inaperturate) in *Bauhinia acuminata*. However, Nair & Sharma (1962), and Tidke et al. (2012), reported the presence of aperture in *B. acuminata* pollen grains. Vishnu-Mittre & Sharma (1962) reported baculate and non-tegillate grains in *B. malabarica*, but in the present study the grains were found with sub- tectate, tectum perforate, with supra- tectal spinules. *B. tomentosa* pollen was earlier known as inaperturate one with verrucose ornamentation (Vishnu-Mittre & Sharma 1962) as well as 3- colporate with striations (Banks et al. 2013), whereas polycolpate apertures and clavate ornamentation have been recorded by us. *B. vahlii* is known to have reticulate exine ornamentation (Vishnu-Mittre & Sharma 1962, Nair & Sharma 1962) as compared to foveolate ornamentation with tectal lumens of different shapes in the present study (Table 1).

It is pertinent to mention here that, although pollen heteromorphism is well known among different species of flowering plants (Mignot et. al. 1994, Dajoz et. al. 1995, Bhowmik & Datta 2012), both the previously recorded characters along with the characters currently recorded are not found simultaneously in the studied specimens of the four species. Therefore, it cannot be said with certainty that these are cases of pollen dimorphism and lays a foundation of debate. More detailed investigation is needed to find out the reason behind such variation in the pollen morphological characters.

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