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## AIRBORNE POLLEN OF *BOMBAX CEIBA* L. : AN IMPORTANT SOURCE OF AEROALLERGEN FROM INDIA

Pampa Chakraborty

Department of Botany, Narasinha Dutt College, Howrah, West Bengal, 71101, India

### ABSTRACT

*Bombax ceiba* L. or kapok is a common tree of Indian subcontinent. Seasonal and diurnal periodicities of airborne BC pollen were recorded with Burkard 7-day sampler in Mahabubnagar, a suburban area near Kolkata city, during 2014. The allergenic potential of BC pollen was studied by skin reaction test and IgE-ELISA of local susceptible patients in clinic. Aeroallergen particles originating from BC pollen were detected by chemiluminescence-based immuno-blotting of exposed Burkard tape exposures during peak days of BC pollen. The aeroallergen spot count was correlated with respective pollen count. The profiles of soluble protein and IgE-reactive protein components of BC pollen were recorded by 1D SDS-PAGE and IgE immuno-blotting.

BC pollen was present in the atmosphere during February-April, constituting 1.6% of total atmospheric pollen load, with a peak (11.6 grains/dm<sup>3</sup>) in the last week of March. The diurnal periodicity pattern of the pollen showed a morning (06:00) to peak in situ reaction, among 116 patients, 26.2% showed positive reaction to BC pollen extract. After screening by skin test and IgE-ELISA, BC pollen mono-sensitised serum samples were used to detect the aeroallergens of BC pollen origin. There was a significant ( $P < 0.05$ ,  $p < 0.05$ ) positive correlation between aeroallergens and pollen count. In SDS-PAGE, BC pollen showed more than 15 soluble protein components, among which six (15-216 kDa molecular weight range) were found to be IgE-reactive in immuno-blotting. The results highlighted the specific role of BC pollen as a source of airborne allergen to trigger IgE-mediated respiratory allergy in susceptible individuals, against which awareness development is necessary.

**Keywords:** Airborne *Bombax ceiba* pollen, periodicity, aeroallergen, IgE-reactive protein components.

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## Wood Anatomy and Topochemistry of *Bombax ceiba* L. and *Bombax insigne* Wall.

Khin Maung Sint,<sup>a</sup> Stergios Adamopoulos,<sup>a,b,\*</sup> Gerald Koch,<sup>c</sup> František Hapla,<sup>a</sup> and Holger Militz<sup>b</sup>

Wood anatomical characteristics, content of phenolic extractives, and topochemistry of two lesser known and underutilised hardwood species, *Bombax ceiba* and *Bombax insigne* were studied. Heartwood and sapwood material was obtained from logs originating from natural forests of Pymmana District, Myanmar. The basic qualitative anatomical features agreed with descriptions reported for the species in other regions (e.g. India, Bangladesh, Southeast Asia). However, there were some light differences in the quantitative wood anatomical data among the regions due to the influence of environmental conditions. The amount of phenolic extractives obtained by gradual extraction with acetone-water was almost the same in heartwood and sapwood (about 1.2%) in *B. insigne*, while heartwood showed a higher amount (2.8%) than sapwood (2.5%) in *B. ceiba*. Topochemical distribution of lignin and phenolic deposits in heartwood tissues investigated by scanning UV microspectrophotometry (UMSP) revealed that *B. insigne* is more highly lignified than *B. ceiba*. For both species, a lower UV-absorbance by the fiber and ray cell wall as compared to that of the cell wall of vessels was observed. Also, phenolic compounds were mostly deposited in the lumina of parenchyma cells and vessels rather than in cell walls. The results further improve the knowledge on the wood anatomy and chemistry of the species and in this respect are useful in future research to broaden their utilisation potential.

**Keywords:** Macroscopic characteristics; Wood anatomical features; Phenolic extractives; UV microspectrophotometry; Lignin; Cell wall layers

**Contact information:** *a:* Wood Biology and Wood Products, Borchardt Institute, Georg-August-University Göttingen, Büsingenweg 4, 37077 Göttingen, Germany; *b:* Technological Educational Institute of Larissa, Department of Forestry and Management of Natural Environment, 431 00 Karditsa, Greece; *c:* Institute for Wood Technology and Wood Biology, Federal Research Institute of Rural Areas, Forestry and Fisheries (ITI), Leuschnerstr. 91, 21031 Hamburg, Germany  
 \* Corresponding author: adamopoulos@trilar.gr

### INTRODUCTION

*Bombax* is a genus of tropical and subtropical trees in the Malvaceae family (Mabberley 2008). *Bombax* species are native to Western Africa, the Indian subcontinent, Southeast Asia, as well as sub-tropical regions of East Asia and Northern Australia. They are among the largest trees in their regions, reaching 30 to 40 m in height and up to 3 m in trunk diameter (Kress *et al.* 2003; Seth 2004). *Bombax ceiba* L. is naturally distributed in Pakistan, India, Myanmar, Indochina, China, Taiwan, Thailand, Java, Borneo, the Philippines, Sulawesi, the Lesser Sunda Islands, the Moluccas, New Guinea, and Northern Australia (Sosef *et al.* 1998). The trees grow 58 to 78 cm in diameter and over 30 m in height and have a straight, cylindrical stem with buttresses at the base (Pearson



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