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

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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 Midnapore, a suburban area near Kolkata city, India. The seasonal periodicity of BC pollen was assessed by pollen count test and IgE-ELISA of local susceptible patients in clinic. Aeroallergen particles were collected from the air using Burkard 7-day sampler and analyzed by immunoblotting of exposed Burkard tape segments during peak days of BC pollen. The aeroallergen spot count was correlated with respective pollen count. The profiles of major aeroallergens of *Bombax ceiba* pollen and the profiles of BC pollen were recorded by 11% SDS-PAGE and IgE immuno-blotting.

BC pollen was present in the atmosphere during February-April, contributing to the total atmospheric pollen load with a peak (100 grains/day) in the last week of March. The diurnal periodicity of the pollen showed a morning (06.00 h) peak. In skin reaction, among 156 patients, 26.24% showed positive response to BC pollen. IgE-ELISA was done with serum and IgE-ELISA, BC pollen mono-sensitive serum samples were used to detect the aeroallergens of BC pollen origin. There was a significant ($R^2=0.95$, $p<0.05$) positive correlation between the pollen count and IgE-ELISA. BC pollen showed more than 15 soluble protein components, among which six (18-21 kDa) were IgE-reactive. These proteins were analyzed by IgE immuno-blotting. The results highlighted the specific role of BC pollen as a source of airborne allergens to trigger IgE-mediated respiratory allergy in susceptible individuals. Further research and awareness development is necessary.

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

139



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

Khan Maung Sint,^a Stergios Adamopoulos,^{b,*} Gerald Koch,^c František Hapla,^a and Holger Miltz,^a

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 Pyinmana District, Myanmar. The basic qualitative anatomical features agree 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

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INTRODUCTION

Bombax is a genus of tropical and subtropical trees in the Malvaceae family (Mahberley 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

Ethnobotanical Profiling of Commonly Utilized Plants for Hypertension and Diabetes in the Province of Laguna, Philippines

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Abstract: The prevalence of hypertension and diabetes is on a steady upsurge worldwide and it has been identified as top ten leading causes of mortality in the Philippines. Plants have been prepared and evaluated for their potential as good antihypertensive and hypoglycemic drugs and provide clues for the development of new and better oral drugs for hypertension and diabetes. Descriptive method of research and purposive sampling technique were used to identify and determine the plants utilized by the people of the province of Laguna for the treatment of the two diseases. The findings of the study revealed that soursop is mostly utilized for the treatment of both hypertension and diabetes. Results also disclosed that soursop, mangosteen, salamander tree and lemon grass besides soursop are mostly utilized for the treatment of hypertension. Further, it entails that bitter gourd, horseradish, and snakeroot are mostly utilized for the treatment of diabetes. Leaves are mostly utilized for medicinal consumption and are prepared by decoction in the form of tea that is drunk one to three times a day.

Keywords: diabetes, ethnobotanical profiling, hypertension

1. Introduction

The prevalence of hypertension and diabetes is on a steady upsurge worldwide and it has been identified as top ten leading causes of morbidity and mortality. Around the globe it is estimated that hypertension causes 51% deaths due to stroke and 45% due to heart disease. Twenty five percent of Filipino adults 21 years old above have hypertension or high blood pressure [1]. Hypertension affects patients with diabetes [2]. There were about 415 million people in the world have diabetes and the prevalence of diabetes in Filipino adults 20 years old above was about 6.1% [3].

The treatment of different diseases using plant began long time ago [4]. Plants have been used both in the prevention and cure of different human diseases [5]. It is estimated that 60% of the world's population rely on traditional health care system derived from medicinal plants [6] and more than 70% of the third world's population depends on traditional medicinal system or alternative systems of medicine [7]. In the Philippines, many patients use medicinal plants as treatment for many ailments and serious diseases like hypertension and diabetes, for several reasons such as cultural and economic. This study aims to document important plants of the Philippines specifically in the province of Laguna, which are commonly utilized by the people of the community for the treatment of hypertension and diabetes. It examined the frequency and manner of how plants are prepared for consumption.

2. Materials and Method

2.1 Study Area

The study was carried out in Laguna. Laguna is a province in the Philippines located in the CALABARZON region in Luzon. It has an area of 1,824 km².

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152

2.2 Ethnobotanical Survey

An interview guide was developed and the questions were focused on the names of the most commonly utilized plants, the part of the plant used, the method of preparation, the way of administration, and the dosage.

2.3 Study Population

A total of 378 patients coming from different municipalities were included in the study. The study population included patients with hypertension and diabetes of both sexes and age ranges from 30 to 95 years old.

2.4 Data Analyses

Participants were asked to present the plants utilized for the treatment of hypertension and diabetes. The species presented by the participants were collected and taxonomically identified.

3. Results and Discussion

The study revealed that 15 plant species are frequently used for the treatment of hypertension and diabetes in the Province of Laguna, Philippines. Five plant species are frequently used by the respondents for the treatment of both diseases (Table 1 and 2). In this study soursop was the commonly used plants for the treatment of hypertension and bitter gourd for diabetes. Information from the literature revealed that ampalaya or *Momordica charantia* are used also in different countries for the treatment of diabetes (Ayyanar et al., [8]; Shanmugam et al., [9]; Talha et al., [10]; Tsabang et al., [11]). Other plants that are also used in the study for the treatment of diabetes are makabuhay or *Tinospora cordifolia* (Azam et al., [12]) and duhat or *Syzygium cumini* (Rout et al., [13]).

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Volume 5 Issue 9, September 2

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