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Native Plants of Bangladesh

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Introduction

Bangladesh, situated at the confluence of the mighty Ganges, Brahmaputra, and Meghna river systems, is renowned for its lush, vibrant landscapes and exceptional biodiversity. Its warm, humid climate and fertile alluvial soils have given rise to a staggering diversity of plant species, making it a vital cradle of botanical wealth in South Asia. From the saline-adapted mangrove forests of the Sundarbans to the rolling rainforests of the Chittagong Hill Tracts and the sprawling Madhupur Sal Forest, each ecosystem harbors its own hallmark flora, underlining the country's distinct ecological identity.

For centuries, the rich tapestry of plants in Bangladesh has sustained livelihoods, inspired local culture, and provided foundational resources for food, medicine, shelter, and economic development. The intricate relationships between people and the native flora are deeply rooted in tradition and continue to shape rural life through folk remedies, community forestry, and the cultivation of fruit and timber trees. These plants are not merely components of the landscape—they are inextricably linked to the spiritual, medicinal, and practical fabric of Bangladeshi society.

Yet, this exceptional floral diversity is not without its challenges. Mounting population pressures and relentless land conversion have led to the steady erosion of native habitats. The incursion of invasive alien species, often inadvertently introduced, threatens to displace endemic plants and disrupt fragile ecological balances. Meanwhile, climate change introduces further uncertainties, altering rainfall patterns, increasing salinity in the south, and augmenting the vulnerability of rare and threatened species. As a consequence, Bangladesh's native flora finds itself at a crossroads, with the very existence of hundreds of species hanging in the balance.

Recognizing these challenges, Bangladesh has embarked on comprehensive conservation strategies, including the creation of a national Plant Red List, the establishment of protected areas, and community-based reforestation programs. Scientific institutions like the Bangladesh National Herbarium are at the forefront of research, cataloging, and preserving the botanical riches of the nation. Moreover, traditional ecological knowledge, passed down through generations, remains an invaluable resource in sustainable plant management and conservation efforts.

This book, *Native Plants of Bangladesh: A Guide to the Native Plants of Bangladesh*, is designed to illuminate the country's remarkable floral heritage. It brings together the latest scientific insights with traditional wisdom, offering a holistic picture of native plant diversity, their ecological importance, socio-economic value, and the urgent need for concerted conservation. Whether you are a student, botanist,

environmentalist, or simply a lover of nature, this guide invites you to explore, understand, and cherish the botanical legacy of Bangladesh—a legacy vital for the nation’s ecological future and cultural identity.

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CHAPTER ONE: The Geography and Climate of Bangladesh

Bangladesh, a relatively small nation nestled in South Asia, occupies a unique geographical position that profoundly influences its climate and, by extension, its rich floral diversity. Stretching across approximately 147,570 square kilometers, the country lies between 20°34' and 26°38' North Latitude and 88°01' and 92°41' East Longitude. Its boundaries are largely defined by India to the west, north, and northeast, while a shorter frontier with Myanmar lies to the southeast. To the south, a highly irregular deltaic coastline, roughly 580 kilometers long, meets the Bay of Bengal, a crucial element in shaping the nation's weather patterns and ecosystems.

The topography of Bangladesh is overwhelmingly characterized by its low-lying, flat terrain, a direct consequence of its position within the vast Ganges-Brahmaputra Delta. This immense delta, one of the world's largest and most fertile, is primarily formed by the confluence of three mighty rivers: the Ganges (known as the Padma in Bangladesh), the Brahmaputra (or Jamuna), and the Meghna. These rivers, along with their countless tributaries and distributaries, crisscross the landscape, creating a complex network of waterways that define the country's physical features. Approximately 79 percent of Bangladesh is occupied by this deltaic plain. The vast majority of the land sits at remarkably low elevations, with most areas less than 10 meters above sea level, and a significant portion even lower, generally at sea level, particularly in the coastal south. This low elevation, combined with the extensive river system, means that water is a constant and predominant physical feature, often leading to widespread flooding.

While the plains dominate, Bangladesh is not entirely without elevated areas. Scattered uplifted blocks, such as the Madhupur and Barind Tracts in the central and northwest regions, account for about 9 percent of the land. The most significant deviation from the flat landscape is found in the Chittagong Hill Tracts in the southeast, where steep hill ranges can reach altitudes of approximately 1,000 meters. These hills, which are essentially the western fringe of the north-south mountain ranges of Myanmar and eastern India, rise sharply to narrow ridgelines. Further minor highlands are also present in the northeast, specifically the Low Hills of Sylhet, and in some northern and northwestern parts of the country. The highest point in Bangladesh is Saka Haphong, located in the Chittagong Hill Tracts, with an elevation of 1,064 meters.

The proximity to the formidable Himalayan mountain range to the north plays a critical role in Bangladesh's climate. The Himalayas act as a natural barrier, influencing wind

patterns and precipitation, leading to a relatively mild winter. This mountainous influence, coupled with its position straddling the Tropic of Cancer, bestows upon Bangladesh a tropical monsoon climate. This climate is characterized by significant seasonal variations in rainfall, consistently high temperatures, and elevated humidity levels throughout the year.

Bangladesh experiences three distinct seasons, each with its own characteristics that profoundly impact plant life. The first is a hot, humid summer, typically spanning from March to June. During this period, temperatures begin to climb, peaking in April, when average maximums can reach 35°C (95°F) in inland areas, though coastal regions tend to be slightly cooler, with highs around 32-33°C (90-91°F) in May due to the sea's thermal inertia. The highest temperatures can soar to 42-43°C (108-109°F) in the north, around 40°C (104°F) in Dhaka, and 37-38°C (99-100°F) in the south. Relative humidity gradually increases, making the heat feel more stifling. This pre-monsoon season also sees the arrival of "northwesters," lines of thunderstorms originating from the Himalayas, which bring rainfall, often accompanied by hail and strong winds.

Following the hot summer is the much-anticipated monsoon season, a period of copious rainfall that generally extends from June to October. The real monsoon arrives between late May and early June, initially impacting the southeast. It brings more consistent cloud cover, persistently high humidity, and frequent downpours. While the rains are heavy, the temperatures tend to drop slightly to around 30-32°C (86-90°F) during the day, though nights remain warm at about 25°C (77°F). Roughly 80 percent of Bangladesh's annual rainfall occurs during this monsoon period. The heaviest rainfall is experienced along the south coast, particularly in the southeastern areas like Chittagong and Cox's Bazar, as well as in the northeast, near the Indian mountains, such as Sylhet. Bangladesh is truly a wet country, with an average annual rainfall of about 2,200 millimeters (87 inches). Most regions receive at least 1,500 mm, while the northeastern border regions can see as much as 5,000 mm of rainfall per year.

The third distinct season is the cool, dry winter, which typically lasts from October to March. The monsoon begins its retreat in October, though some residual rains can linger, especially in the southeast or if a cyclone makes an appearance. November generally offers warm, sunny days with highs around 30°C (86°F). The true winter months, December and January, bring pleasant, sunny days and notably cooler nights, particularly in the northern regions. Inland areas, including Dhaka, can experience fog, and some days may be quite cool, with highs falling below 20°C (68°F). The average temperature in Dhaka during January is around 19°C (66°F).

Humidity remains high throughout the year in Bangladesh, peaking during the monsoon season. The average relative humidity typically ranges from 55% to 85% across different cities. For instance, Chattogram often records the highest average relative humidity at 78%, followed by Dhaka at 76%. In Dhaka, the highest humidity

levels are observed in June, reaching around 83%, while the lowest is recorded in March at 61%, with an annual average of 74%. This high humidity, especially during warmer months, can make the perceived temperature feel significantly higher than the actual thermometer reading.

The dynamic interaction of these geographical and climatic factors creates a mosaic of ecological zones, each with its unique conditions that support specific plant communities. The fertile alluvial plains, constantly replenished by riverine silt, are ideal for a wide array of vegetation, while the abundant rainfall ensures lush growth. However, this blessing also presents challenges. Bangladesh's low elevation and extensive river network make it highly susceptible to natural disasters, primarily floods and tropical cyclones, which are exacerbated by storm surges from the Bay of Bengal. Cyclones are a particular concern, typically occurring from April to December, with peaks in intensity just before and after the monsoon season. These events can have devastating impacts on both human settlements and natural ecosystems, including plant life.

The constant ebb and flow of water, from the annual monsoon floods to the intricate river systems, dictates the character of Bangladesh's flora. Plants here have evolved remarkable adaptations to thrive in such a water-rich and often water-logged environment. From the salt-tolerant species of the Sundarbans to the diverse aquatic plants inhabiting the countless ponds, wetlands, and floodplains, the native flora of Bangladesh is a testament to nature's resilience and adaptability in a challenging yet immensely fertile landscape. The very geography that brings both bounty and occasional hardship also cultivates a unique botanical heritage.

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