Chapter 10
Adansonia digitata (Baobab): A Phytochemical and Pharmacological Appraisal of Its Ethnomedicinal and Nutraceutical Significance

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ABSTRACT

Adansonia digitata L., widely known as the baobab tree, is a culturally revered and pharmacologically significant species native to Africa. This chapter presents a comprehensive synthesis of its botanical attributes, traditional medicinal applications, and the bioactive compounds responsible for its therapeutic effects. Parts of the plant—including the leaves, fruit pulp, seeds, bark, and roots—have been traditionally used to manage conditions such as fever, infections, inflammation, and gastrointestinal disorders. Phytochemical analyses have identified a diverse array of constituents, including flavonoids, polyphenols, sterols, amino acids, and organic acids, many of which contribute to the plant's antioxidant, anti-inflammatory, antimicrobial, and antidiabetic activities. With its growing presence in nutraceuticals,

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cosmetics, and herbal formulations, A. digitata represents an underutilized yet highly promising botanical resource for natural product drug discovery and public health innovation.

1.0 INTRODUCTION

Adansonia digitata L., commonly known as the baobab tree, is a keystone species native to the arid and semi-arid zones of sub-Saharan Africa. Its massive trunk, exceptional longevity, and capacity to store large quantities of water enable it to withstand prolonged drought, making it one of the most ecologically resilient African tree species. Although native to mainland Africa, *A. digitata* has been introduced to parts of Asia, the Caribbean, and South America owing to its multipurpose value and adaptability (Orwa *et al*., 2009; Wickens and Lowe, 2008). It is the most widely distributed member of the *Adansonia* genus, which comprises eight species globally.

Beyond its ecological significance, baobab plays a central cultural, nutritional, and medicinal role across many African communities, where it is often referred to as the "Tree of Life." Nearly all plant parts including the leaves, fruit pulp, seeds, bark, and roots are used in traditional medicine to manage fever, microbial infections, gastrointestinal disturbances, anemia, pain, and inflammatory conditions (Brendler *et al*., 2003; Van Wyk and Gericke, 2020). Its cultural importance extends to spiritual practices, food security systems, and local economies.

In recent years, scientific investigations have provided growing evidence to support many of these traditional applications. Baobab is rich in bioactive compounds such as vitamin C, polyphenols, flavonoids, sterols, amino acids, and essential minerals, which have been associated with antioxidant, anti-inflammatory, antimicrobial, antidiabetic, and hepatoprotective effects (Chadare *et al*., 2009; Coe *et al*., 2023; Spínola *et al*., 2020). This expanding pharmacological evidence, combined with increasing global demand for plant-based functional foods and natural therapeutics, has positioned *A. digitata* as a promising botanical resource for nutraceutical development, herbal medicine, and novel drug discovery.

2.0 HABITAT AND GEOGRAPHICAL DISTRIBUTION

The precise evolutionary origin of *Adansonia digitata* L. remains a subject of scientific debate, although it is widely regarded as indigenous to the savannas and dry woodlands of sub-Saharan Africa. Phylogenetic and bio-geographical evidence suggests that mainland Africa is the primary center of diversity, while Madagascar; home to six other *Adansonia* species may represent a secondary diversification zone