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The Uses of the Baobab Flower (*Adansonia digitata* L.)

John Rashford

Research

Abstract

In the now extensive literature on the African baobab, the use of the flower is often overlooked or described as minimal. This paper presents a synthesis of the uses of the baobab flower that incorporates the results of my own fieldwork on the introduction and cultural significance of the baobab in Florida, the Caribbean, and Brazil. Fieldwork conducted over the past 30 years has involved locating, measuring, and photographing baobabs; observations on flowering and fruiting and such things as the size and shape of fruits and the number of seeds per fruit; and structured and unstructured interviews and community discussions to determine the cultural significance of the tree. In addition to publications and word of mouth, baobabs were also located by appeals to the public involving newspaper interviews and radio interviews. Although the uses of the baobab flower have yet to be documented in a manner comparable to other parts of the tree—especially the fruit, leaves, and bark—the present study shows it is far from being useless or of little use as some premature assessments would suggest. This initial summary is intended to encourage greater attention to the uses of the flower in the increasingly sophisticated research on the baobab that is now being done in Africa and elsewhere.

Resumen

En la literatura del baobab africano, hoy en día extensa, el uso de la flor a menudo se pasa por alto o se describe como mínimo. Este artículo presenta una síntesis de los usos de la flor del baobab que incorpora los resultados de mis estudios en el campo relativos a la introducción y el significado cultural del baobab en Florida, el Caribe y en Brasil. El trabajo de campo realizado en los últimos 30 años se ha dedicado a localizar, medir y fotografiar baobabs; a hacer observaciones de la floración y la fructificación y de cosas como el tamaño y la forma de los frutos y el número de semillas por fruto; a llevar a cabo entrevistas estructuradas y no estructuradas, así como conversaciones con la comunidad para determinar el significado cultural del árbol. Además de las publicaciones y referencias verbales, también se localizaron baobabs por medio de llamados al público en entrevistas radiales y en periódicos. A pesar de que los usos de la flor del baobab aún están pendientes de documentarse en forma comparable a las otras partes del árbol—especialmente el fruto, las hojas y la corteza—el presente estudio muestra que, contrario a lo que valoraciones prematuras sugieren, la flor está lejos de ser de poca o ninguna utilidad. Este extracto inicial pretende atraer más atención a los usos de la flor en la investigación del baobab, la cual es cada vez más sofisticada y que ya se realiza en África y en otras latitudes.

Introduction

The massive long-lived baobab (*Adansonia digitata* L.) pictured in Figure 1, which is symbolic of the African continent and its diverse peoples and an icon of the savanna landscape of human evolution, is the most prominent

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Figure 1. A baobab (*Adansonia digitata* L.) grove in Senegal, West Africa.

member of the genus *Adansonia*, a small group of Old World tropical trees in the Malvaceae (until recently, Bombacaceae), a family that includes six species endemic to Madagascar and one to Australia (Baum 1995a, 1995b, Baum *et al.* 1998, Wickens & Lowe 2008). It is famous for its many uses including its edible leaves, fruit pulp, and seeds; its bark fiber used for such things a cordage and basketry; the water stored in its hollow trunk and in its wood; its nesting bees which makes it a honey tree; and its fruit shell used for various containers and musical instruments. It is often said that "every part" or "virtually all parts" of this multipurpose tree are useful. It would seem, judging from either perspective, that the least-used part of the tree is its large, hibiscus-like flower (Figure 2).

For example, Owen (1970:25), in his influential article on the baobab's medical, social, and cultural significance in Africa, identified baobab flowers only as conspicuous and bat-pollinated with a "disagreeable putrid odour when they begin to die or are crushed" and he came to the surprising conclusion that they had "no particular significance" for

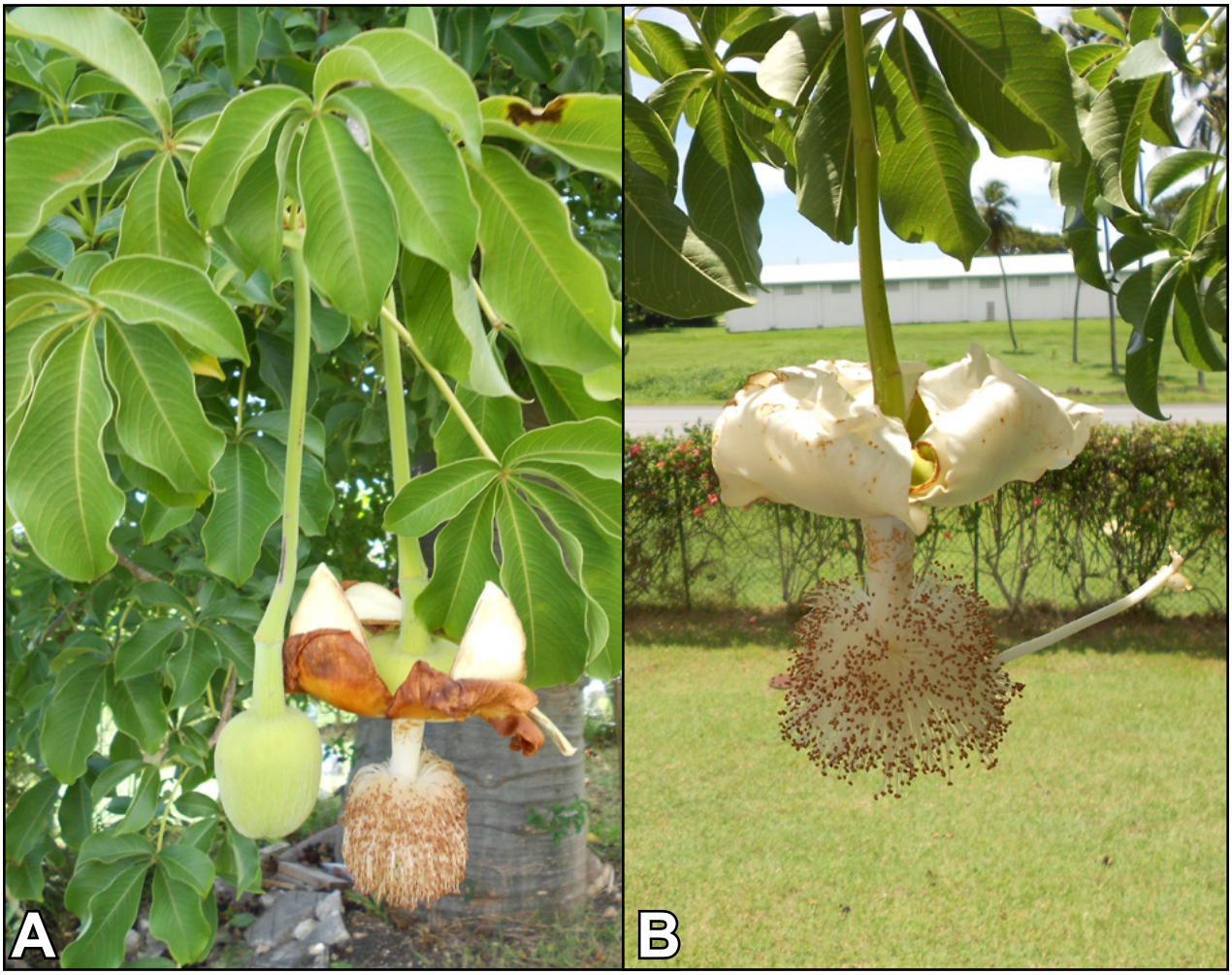

Figure 2. Baobab (*Adansonia digitata* L.) (**A**) flower bud and senesced flower and (**B**) "morning after" flower of the Water Company baobab in Bridgetown, Barbados.

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Africans. Similarly, Wickens (1978, 1982) mentioned only one use for the flower in his early summaries of the tree's importance in Africa and so did De Caluwé *et al.* (2010). Recent publications do not even mention the use of the flower (e.g., Chadare *et al.* 2008, Schumann *et al.* 2012), the work of Wickens and Lowe (2008) being a notable exception. For Goody (1993), of course, this suggestion of an African indifference to the baobab flower would be further evidence that "the culture of flowers" did not exist in traditional Africa, and by "culture of flowers" he meant flowers attractive in form, color, or fragrance that were used for decorations, personal ornamentation, garlands, religious offerings, gift-giving, and funerary customs and that were symbolically represented in such things as poetry, literature, and designs in the creative arts. Africans, we learn, did not gather wild flowers nor did they cultivate wild or domesticated flowers for use or sale, and in any case, showy flowers were scarce in the African environment.

The baobab attracts human attention wherever it grows because of its exceptional size, shape, longevity, and utility, and it is unlikely that Africans would not have taken note of its conspicuous flower both for its aesthetic appeal and as a curiosity, especially given the baobab's long flowering period when the ground beneath the tree is often littered with spent blooms. The baobab flower is noteworthy, not only because it is large, luminous white and produced in abundance during the annual rains from spring through early autumn, but especially because of the curious way in which it is suspended upside down at the end of a long flexible stalk, coupled with the fact that it is night-blooming, odiferous, and bat pollinated (Figure 2). "The flower is, indeed, very unusual," wrote Vaid (1978a:41), and many have identified it as "showy" (e.g., Dassanayake & Fosberg 1980:68, Owen 1970:25). Palmer and Pitman (1961:231) described it as "handsome," Morton (1977:84) as "dramatic," Onderstall (1979:76) as "indescribably beautiful" and as "one of Africa's loveliest flowers," Watson (2007:48) as "striking" and "magnificent," and the artist Patrick Mavros (2005) as "the prettiest [flower] in all Africa."

Methods

This paper presents a synthesis of the uses of the baobab flower that incorporates the results of my own fieldwork on the introduction and cultural significance of the baobab in Florida, the Caribbean, and Brazil. Fieldwork conducted over the past 30 years has involved locating, measuring, and photographing baobabs; observations on flowering and fruiting and such things as the size and shape of fruits and the number of seeds per fruit; and structured and unstructured interviews and community discussions to determine the cultural significance of the tree. In addition to publications and word of mouth, baobabs were also located by appeals to the public involving newspaper and radio interviews. Although the uses of the baobab flower has yet to be documented in a manner comparable to other parts of the tree—especially the fruit, leaves, and bark (e.g., Assogbadjo *et al.* 2005, 2008)—the present study shows it is far from being useless or of little use as some premature assessments would suggest. This initial summary is intended to encourage greater attention to the uses of the flower in the increasingly sophisticated research on the baobab that is now being done in Africa and elsewhere.

Practical Uses

Food

The baobab, justly celebrated as an exemplary multipurpose tree valued for all its parts, deserves equal recognition as a multisource food tree since it provides not only staples in the form of leaves, fruit pulp, seeds, and honey, but also edible root, bark, buds, flowers, and seedsprouts. Some of these fresh or cooked baobab foods are especially important during the annually recurring period of seasonal hunger and in times of famine (Kranjac-Berisavljevic & Gandaa 2009, Rashford 1987b, 2002). The culinary use of the flower, however, like that of the root, bark, and buds, is often overlooked when compared to the extensive literature on the fruit pulp, seeds, and leaves (Figure 3). And yet, Hines and Eckman (1993) identify the fruit, leaves, and flower as "very important in terms of their nutritional value," noting that the seed and flower were "high in protein."

Irvine (1952:34) indicated that "flowers are seldom used as a staple article of food, though some of the large and more fleshy ones are eaten alone." The baobab flower would seem to be among the exceptions to this general rule. "The [baobab] tree … was a godsend to the poor," wrote Thomas Pakenham. "If you needed fresh salad you could eat both the elegant white flowers and the pale green foliage" (2004:13). This vague suggestion that the flower is widely eaten in Africa is not supported by what is currently known. Nevertheless, Aitken (1951:459) said it was "sometimes crushed with sugar and water to make a refreshing and unusual beverage." In his account of the characteristics and uses of the trees and shrubs of the Sahel, Von Maydell (1986:152) reported baobab flowers were eaten raw as did an anonymous author (2002a) in Ghana's *Accra Mail* newspaper. Booth and Wickens (1988:13) provided a similar report, adding that they were also "used to make a liquor." Shackleton *et al.* (2009:72) included the baobab flower in their overview of African indigenous vegetables in urban agriculture, noting its use in the Sahel, "particularly in parts of Burkina Faso." Eating the raw flower and using it to make a beverage has also been reported for the Sudan (Gebauer *et al.* (2002:158) and for Benin (Wickens & Lowe 2008:95), and De Caluwé *et al.* (2009:438) have indicated that in Benin the filtered ash of the woody calyxes and pedicels were used as potash in cooking and in traditional soap-making. Finally, in "Namibia," according to Wickens and Lowe (2008:95), "the herd boys seek out the nectar (Gebauer *et al.* 2002a, Mshigeni & Hangula 2001, Toutain 1978)."

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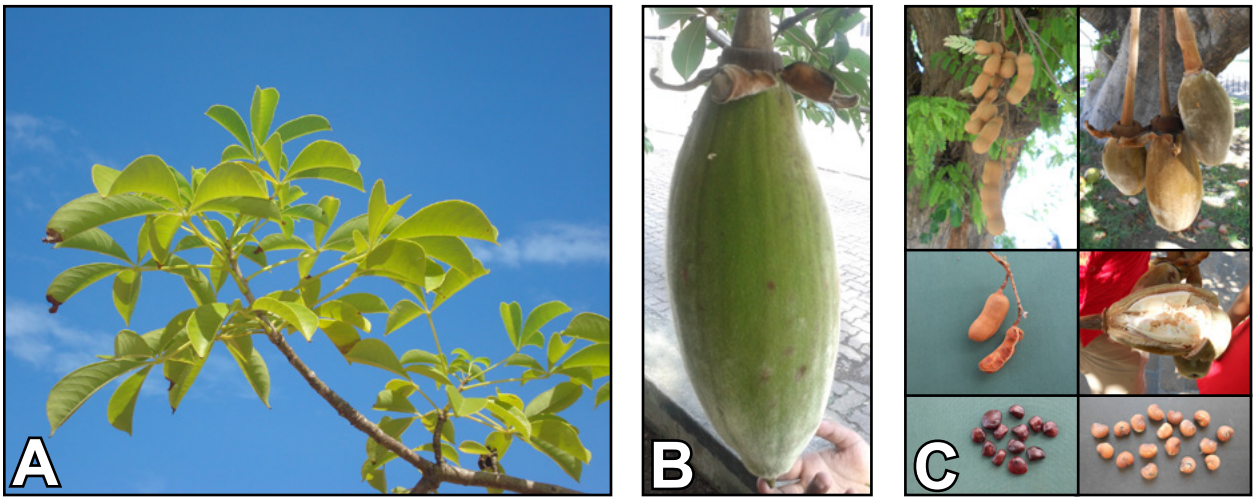

Figure 3. (**A**) Baobab (*Adansonia digitata* L.) leaves; (**B**) a developing baobab fruit; (**C**) the taste-alike fruit of the baobab (right) and tamarind (left) compared. In the Caribbean and in India the baobab is often identified by name as a kind of tamarind (see Burton-Page 1969, Rashford 1987a, 1994a, 1997a).

Animal feed, hunting, and honey

The ground beneath the baobab is littered with spent flowers during the annual flowering from spring through early autumn. The fact that many animals feed on the flower has important implications for the value of the tree for humans. The abscised flower attracts browsers which create a hunting site, and flowers are also collected for use as bait for hunting and catching insects. Lamprey (1963) noted that impala eat the fallen flowers. Burton-Page (1969:333) saw deer feeding on them in India, but he knew "of no instance of them being collected as cattle fodder (as with *Bombax*), for example." Nevertheless, Palmer and Pitman (1961:232) reported that "cattle are said to love the flowers like pudding," and Wickens and Lowe (2008:78) wrote, "Domestic animals, including camels, and wild herbivores eagerly browse accessible leaves and fallen leaves and flowers, especially in the drier regions." While there is no evidence of the intentional use of the picked or fallen flowers to feed livestock as occurs with baobab leaves in various parts of Africa, De Caluwé *et al.* (2009:438) document the use of the flower to make a termite trap. The abscised "corollas are collected, dried, and then mixed with cattle faeces and placed in a bowl. Subsequently, this bowl is placed upside-down close to a termite hill and left for 24 hours." The trap is then used to provide food for poultry, and it also serves as "an example of local veterinary medicine to reduce poultry mortality rates."

Watson (2007:123–124) gives a contradictory view of the ecological status of the flower. On the one hand he says, "The baobab's fallen flowers seem to be one of nature's least utilized by-products, instantly redundant once they hit the ground, and ignored by most creatures as a source of food." On the other hand he gives us a glimpse of what the flower could have meant to ancestral foragers of the African savannah.

> "Munyao Mwakavi is a Wakamba driver, old enough to have some grey hairs and also to remember a much wilder environment than exists today. As a youth he would build a platform in a tree next to a flowering baobab and wait with his bow and arrow for bushbuck to emerge in the evening from their daytime cover and start grazing on fallen flowers. Sometimes Munyao would even scatter handfuls of flowers below his perch, to give himself a better chance of shooting the animals cleanly. Now the bushbuck have gone, to be replaced by goats and sheep, and as soon as he lets these out every morning, they too scamper over to the nearest baobab to see if any flowers fell in the night." (Watson 2007:123–124)

The ecological associates of the baobab flower make it far more important in human evolution than is evident in Watson's perspective. At the September–October height of the May–October dry time, Hadza foragers ambush large game along well-worn tracks to permanent sources of water. In autumn they ambush animals that prey upon the ripening crops of their farming neighbors which they are hired to protect. And during the November–April rains they ambush animals that visit the baobab to feed on its fallen flowers (Peterson 2013:35).

It is important that the baobab is widely identified in popular media, especially via the Internet, as a tree of life, the tree of life, and Africa's tree of life. The baobab's image with this tree-of-life identity appears on wall hangings, posters, paintings, quilts, batiks, bronze figures, and ostrich eggs. The tree-of-life name also occurs in association with the growing international trade in baobab-related items which include various foods, beverages, cosmetics, pharmaceuticals, and floral essences. The baobab's status as an ecological tree of life—especially in terms of the

contribution of the flower which attracts a wide variety of species—adds to its multipurpose value as a resource-rich tree of life for human beings, and this includes more than the flower's availability as animal feed or its use as bait for hunting or catching termites.

The baobab flower is generally thought to be chiefly pollinated by bats, but it is also visited by bush babies, moths, ants, wasps, and bees. As Wickens and Lowe (2008:222) reported, bees take "advantage of the minute opening of the sepals in the late afternoon before the flowers have fully opened, to enter the bud and steal pollen (Guy 1971, Guy 1972, Humphries 1982, Jaeger 1950)." And, it is noteworthy that bees not only gather pollen from the flower, they frequently establish their hives in the baobab's hollow trunk and branches. The baobab is deservedly identified as a premier honey tree, and this makes the flower a meaningful aspect of the tree's importance for humans.

Consider the following example of the 1,000 or so Hadza: the highly mobile foragers living in the baobab-clad uplands surrounding Lake Eyasi in the Eastern Rift Valley of northern Tanzania who are well known for their love of honey. The fact that they live on the African savanna in an area rich in hominin fossils, that they have remained viable foragers in the ancestral landscape of human evolution, that they frequent natural baobab apiaries, and that they have been extensively studied, especially from an evolutionary perspective, makes their use of the tree an ideal perspective for exploring the roles of the baobab as the tree of life in human evolution (Kusimba 2003, Mabulla 2003, 2007, Marlowe 2010). The Hadza value honey both for consumption and trade, and its trade value includes honey bartered with neighboring groups and wax sold to those the Hadza identify as Swahili merchants. Honey makes up 20% of the Hadza diet that is not comprised of plant foods (Woodburn 1972) and, along with the baobab fruit pulp and seeds, is the major non-meat food of the Hadza throughout much of the year (Crittenden 2011, Marlowe 2010, Marlowe *et al.* 2014, Murray *et al.* 2001). Nutritionally, honey contributes an important percentage of calories to the Hadza diet, and fondness of honey among the Hadza represents an important aspect of their relationship to the baobab tree. In their recent study, Berbesque and Marlowe (2009) document the Hadza ranking of their staple foods. They report both men and women ranked honey as number one and baobab as number two, but they differed on the relative position of meat and berries. Men placed meat in third place ranking it above berries while women placed berries in third place ranking it above meat. In light of the baobab's importance as a honey tree the following account from Benin is noteworthy: "Dried corollas are burned, and a heavy smoke, which repels insects, is developed and can be used to chase away bees while harvesting bush honey" (De Caluwé *et al.* 2009:438).

Health

The use of the baobab flower potash in soap-making is not the flower's only application in healthcare. Dalziel (1937:114) wrote: "An infusion of both flowers and leaves is used for respiratory and digestive disorders and for eye inflammations." With respect to digestive disorders Etkin and Ross (1982:1561) make specific reference to the Hausa of northern Nigeria, while with respect to respiratory disorders generally, De Caluwé (2010) cites the works of Addy *et al.* (1995) who they say was referenced by Shukla *et al.* (2001), but Addy *et al.* (1995) had nothing to say about the use of the baobab flower. Wickens and Lowes (2008:95) indicated, based on the authors cited, that "baobab roots and flowers have unspecified gynecological applications in Mali" (Gustad *et al.* 2004), and the flowers are used to "speed the ejection of the fetus" in Benin (Codjia *et al.* 2001).

Technology

Plants have always been important in human history in supplying a wide range of technological means, and the baobab is no exception. Traditionally, the tree has been prized in many parts of Africa as a source of bark fiber, as a tree cistern especially valued in the dry places to which the tree is naturally adapted, and as the producer of a fruit shell used for various kinds of container, which accounts for the baobab's calabash name in parts of Africa. Wickens (1982:192) cited Woodruff (1969) who reported that the "only recorded economic use of the flower is the mixing of the pollen with water to make glue." This is one of the early reported and frequently cited uses of the flower (Palgrave 1957, Wickens 1982, Wright & Kerfoot 1966:52), and it is widely reported in the literature today (e.g., Kamatou *et al.* 2011:911, Watson 2007:147). It is surprising then that Wickens and Lowe (2008) did not mention the use of the flower to make glue in their recent comprehensive treatment of the botany and uses of the genus *Adansonia*.

Time marker

One of the most important uses of flowers around the world is as temporal markers. Individuals everywhere must synchronize their activities with each other in relation to their seasonal environment as the object of their productive and inspirational activities, and to accomplish this they need temporal markers. Environmental features that serve as seasonal markers, including terrestrial, climatic, and biological changes, have to be both sufficiently distinct and of cultural interest to serve as indicators of particular times of the year. This is clearly the case with the baobab flower which serves as a rain indicator, planting cue, and harvest forerunner. Describing the baobab's spring flowering as a seasonal marker for the Mbeere of Kenya, Riley and Brokensha (1988:197) reported that "the nocturnal blossoming of these trees, taken in asso-

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ciation with **(mw)-arange** (*Delonix elata* (L.) Gamble), is used as a weather indicator for planting at the start of the long rains in March–April." Not surprisingly, the baobab tree itself is also associated with rainmaking ceremonies (Ferry *et al.* 1974, Watson 2007:49, Wickens & Lowe 2008:52–53).

The annual return of the growing season around the world, widely linked to festivities based on the theme of renewal, is generally associated with symbols of youth, love, courtship, marriage, sex, and fertility. This key moment of the yearly cycle is, after all, the foundation of major contemporary celebrations in temperate latitudes that mark the annual seasonal rebirth either by placing emphasis on the winter solstice and the return of lengthening days or the first winter-signs of spring or the full expression of spring manifested in the early or mid-spring months of April and May. We have only to think of holidays like Christmas, the New Year, and April–May suite of celebrations that in one way or another make up a good part of our everyday understanding of seasonal change and which, incidentally, comprise much of the discussion of flowers in Goody (1993).

The use of flowers as temporal markers was of little interest to Goody. The only exception he could find to his thesis of the absence of floral traditions in Africa was flowers as markers of the approaching harvest of fruits, which he described as "flowers as forerunners of crops," and writing of the LoDagaa of West Africa Goody noted (1993:17):

> "[T]he 'flowering' of the maize corn heralds the harvest and signals the time for the Dance of the Hoe to take place in the market places of the district. In a technical sense, the same holds true in English and other European languages. It is significant in this regard that the goddess Flora, so long established in central Italy, at first looked after the flowering of cereals, of vines, and of fruit trees. It was only later that she became goddess of flowers 'in the full meaning of the word.' Her cult, initially concerned with bad harvests, was given official recognition and in 240 BC the Floralia or floral games were instituted in her honour, being celebrated annually from 173 BC. Historically the 'flower' seems first to have been the promise of fruit, not a thing itself."

Goody (1993) was clearly more focused on the flower as a harvest forerunner rather than a rain indicator or planting cues, and yet all three kinds of floral temporal markers are associated with the baobab flower.

Political symbol

There is no record of the symbolic use of the baobab flower in traditional Africa. Today, however, it serves as a political symbol, being the national flower of Tanzania and appearing on the stamps of several African countries (Wickens & Lowe 2008:xix). In his sales catalogue of cacti and succulents on stamps, Geissler (2002) identified twelve countries that presented the baobab, with some having two or more baobab stamps. The tree is featured in most cases, but some stamps also include singly or in combination the leaves, fruit, and flower. The tree and flower are pictured on stamps from Mauritania (Figure 4A), Senegal (Figure 4B), Rwanda (Figure 4C), Zambia (Figure 4D), Barbados (Figure 4E), Gambia (Figure 4F), and South Africa (Figure 4G). With the Zambian stamp the flower is presented in the foreground and the tree in the upper left corner. In Senegal, Gambia, and Rwanda only the flower is presented. Curiously, the South African (Figure 4G) and Zambian stamps (Figure 4D) picture the flower upside down as if it was a normal flower opened to the sky rather than turned to the earth, and this has also been done by Baillon (1876–1892:363), Sweeney (1974:57), and others, while the Rwanda stamp (Figure 4C), unlike the flower in perfect bloom on the Senegalese stamp (Figure 4B), presents a dying flower with its fallen perianth, stamens, and pistil at the point when the flower is not far from falling from the tree.

Inspirational Uses

Oral Traditions

Reports of the uses of the baobab flower in Africa have largely focused on its practical value, especially food, with little attention given to its inspirational uses. The flower's inspirational uses are those associated with oral traditions, religion, aesthetics, and recreation. Oral traditions include such things as naming customs, proverbs, riddles, word games, legends, folktales, traditional beliefs, popular expressions, and humor.

A familiar common name for the baobab that occurs widely in print and on Internet sites is the upside-down tree, and the origin of this name is invariably attributed to the tree's seemingly upside-down appearance, especially in the dry time of the year when it is leafless and its enormous girth and stubby branches are prominently displayed. That Africans traditionally conceived of the baobab tree as in some sense upside-down is evident in a widely reported folk narrative (identified in the literature as a story, legend, belief, myth, or tale) that has many variations. For example, it is said the baobab was planted upside down by God as an accident or as punishment for its constant complaining, disobedience, envy, and boastfulness (Wickens & Lowe 2008:50–51); by a hyena described as either angry and vengeful (Wright & Kerfoot 1966) or stupid and lazy (Anonymous 1981:1–2); by "a powerful and evil spirit" that was offended by the baobab which Weiss (1979:40) attributes to a legend in Mombasa; or by the malevolence of the devil, a view the *Encyclopedia Britannica* (2015) identified as an Arab Legend (see also Owen 1970:27 and Armstrong 1977:212). What the different versions of the

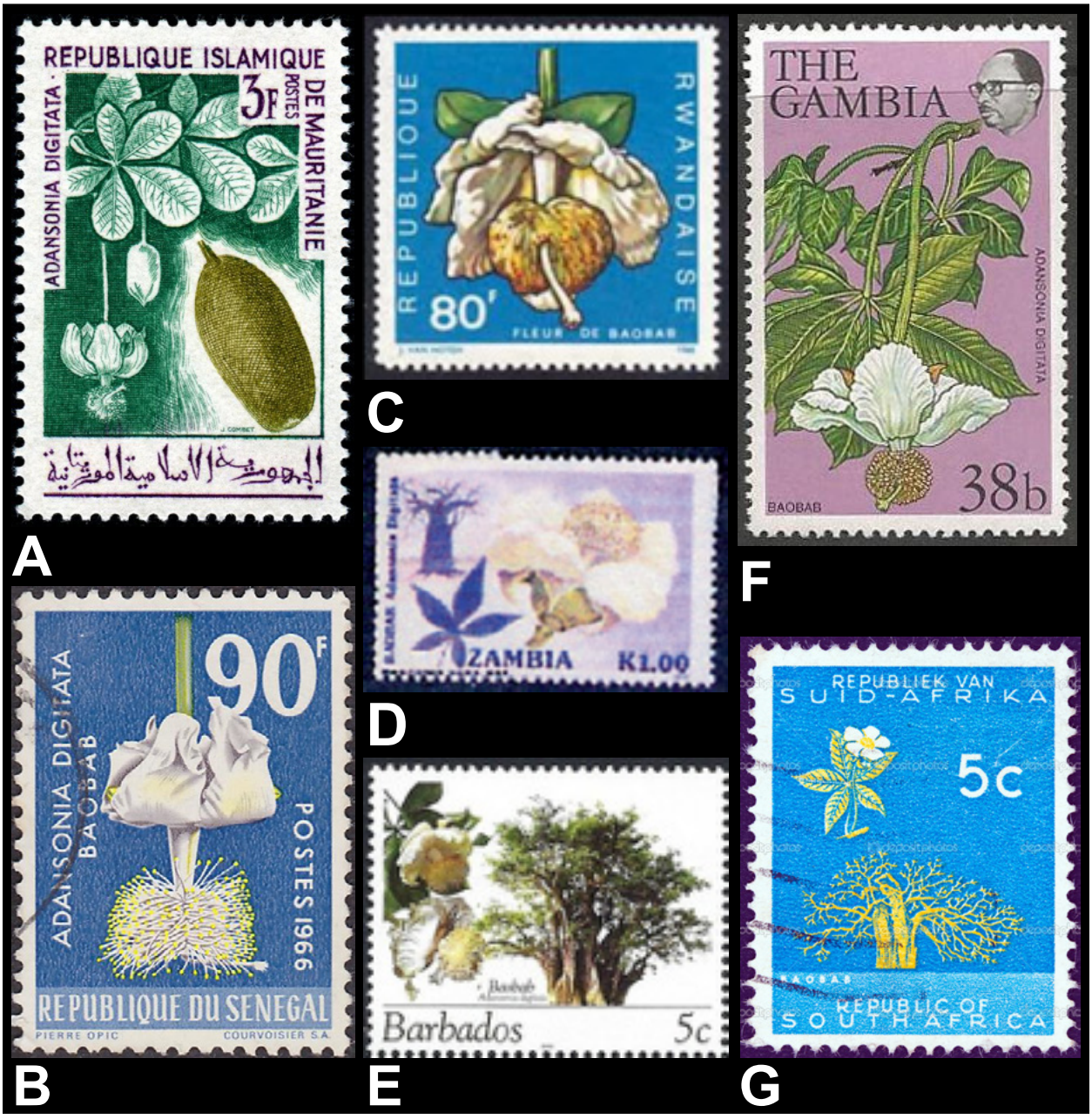

Figure 4. Baobab (*Adansonia digitata* L.) flower on stamps from (**A**) Mauritania, (**B**) Senegal, (**C**) Rwanda, (**D**) Zambia, (**E**) Barbados, (**F**) Gambia, and (**G**) South Africa.

legend do not tell us, however, is the specific reason why the tree is considered to be upside-down. In the literature, the tree's inverted position is always assumed to be a reference solely to the appearance of the thick trunk and stumpy root-like branches, especially as seen in the winter dry season when the tree is leafless. This is clearly part of the truth but a more complete understanding must also include the baobab's upside-down flower, upside-down pollinating bats, and upside-down symbolic significance. At the most inclusive level, to explain the conception of the baobab as having been planted upside down it is necessary to look at the inspirational significance of the tree in African traditional life within the framework of the dual symbolic system of classification which enters into the religious world view of all people. Not only does the bizarre shape of the baobab and its flower suggest that the tree was planted upside-down, but the tree is also upside-down symbolically. This places the baobab on the feminine side with strong links to fertility from a variety of perspectives given its pregnant shape, vagina-like hollow

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trunk, breast-shaped fruit, and popular milk-colored drink; its links to water, especially its use as a natural or artificial water cistern and as a rain indicator and planting cue; its connection to darkness, especially in terms of its upside-down nocturnal flower; its diverse floral associates which establish a noisy presence in the tree at night when the flowers open; and its frequent association with what is life-manifesting and life-giving.

There is another widespread traditional belief frequently mentioned in the literature on Africa that anyone who picks the baobab flower, which is said to be inhabited by spirits sometimes identified as "evil spirits" (Layser 2001:152) or "ancestors" (Olasky 2005), will be eaten by a lion (Hardy & LaFon 1982:52, Palmer & Pitman 1961:234). It is easy to understand why there is a conception of spirits inhabiting the flower given the flower's nocturnal associations, especially bats and bush babies which frequently occupy the tree's hollow trunk. The flower's links to these mammals and to other species is an important component in classifying the baobab as an ecological tree of life, and it is this status that contributes to the baobab being a resource-rich tree of life for human beings. As earlier noted, this is especially true of honey produced by bees that frequent the baobab flower and typically establish their hives in the cavities of the tree's trunk and branches.

The taboo against picking the flower on pain of death—a taboo aimed at ensuring the later availability of the fruit as the most valued part of the tree—would certainly influence the use of the living flower, but it would not necessarily limit the use of fallen flowers.

Religion

The religious use of flowers for Goody (1993) includes such things as offerings, garlands, ritual objects, shrine decoration, and spiritual symbols. While there are no reports of these specific uses of the baobab flower in Africa, it is clear that the flower's inspirational value for Africans does include religion. The baobab's links to Africa's oral and religious traditions mark it as a spiritually important tree often protected wherever it grows. As earlier noted, Africans have been unwittingly and intentionally encouraging baobab trees throughout their settlement environment for millennia, especially as a part their religious landscapes. The baobab defines a spiritual place where the tree itself is often used as an altar site or altar. Ritual objects at the base of the tree and a trunk stained with offerings are widely reported in the literature (Bolandier & Maquet 1974:144, Parrinder 1949:28, 1954:52, Wickens & Lowe 2008:52–53). The fact that the baobab serves as an altar site or altar makes it the ceremonial focal point of a community, and its spiritual role is closely linked to its uses associated not only with oral tradition and religion, but also with aesthetics, recreation, and symbolism.

The baobab is a place of spirits identified as living beneath, on, or in the tree, and it is significant when we also learn that spirits, especially ancestral spirits, are said to inhabit the flower. People establish contact with these spirits to realize their desires for such things as health, love, fertility, and good fortune. Even in the capital of Tanzania this point was made clear about a well-known tree in Dar es Salaam in an anonymous article (2002b) titled "Giant baobab tree comforts ailing, lovelorn Tanzanians."

In India, Wickens and Lowe (2008:122) reported that the baobab's "sweet-smelling flowers" are "used...for religious and other festivities," and we can conclude from Vaid's (1978a) work that the flower has long been of importance in Hindu religious thought. In his widely cited article on the introduction of *Adansonia digitata* into India, Burton-Page (1969:333) identified three periods associated with the arrival of the baobab in India. The earliest he attributed to "Arab traders" for whom the tree had no value "except for the fruit for a refreshing sherbet for Muslim women," followed by the Moguls who grew the tree as a garden curiosity, and the British who planted the baobab as a curiosity, ornamental, garden specimen and shade tree in such places as botanic gardens, arboreta, zoos, and golf courses (Maheshwari 1971:58, Prain 1963:184; Santapau & Henry 1973:4, Vaid 1978a, 1978b, Watt 1889:105–107).

Vaid (1978a), however, offered an alternative perspective on the earliest introduction of the baobab into India. The argument he presents is especially intriguing from the vantage point of the spiritual role of the flower:

> "The question that has been haunting the mind of the scholar as well as the imagination of the layman for millennia—where is [India's] … mythical wishing tree, the **kalpa-vriksha** mentioned in all our puranic literature?" (Vaid 1978a:35)

Vaid's thesis was that the giant, strange-looking, long-lived, multipurpose baobab was India's mythological "wish-fulfilling" tree called **kalpa-vriksha**, associated with India's ancient Hindu religious sites, sacred literature, temple sculpture, folklore, and contemporary ritual practices. According to Vaid,

> "All ancient literatures describe it as an immortal tree of colossal dimensions, laden with fruits, its roots penetrating into unreachable depths, … its flowers are of unusual shape and they have a strange aroma, and … the tree fulfilled every wish made under its bough" (Vaid 1978a:35).

While Vaid accepted the conventional view that the baobab is an exotic tree in India, he argued (based on what he described as an "interdisciplinary approach" involving botany, archaeology, mythology, and phytogeography) that the tree had been in India over 4000 years and was probably introduced by "Indian seamen" who made "circuitous voyages all around the Arabian Sea and adjacent parts of the Indian Ocean" (Vaid 1978a:37). Vaid's view

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incorporated the famous Hindu story of the **amrit manthan** or **sagar manthan** (churning of the ocean) which he thought identified the baobab as one of the fourteen rare treasures from the sea described in the Bhagavat Gita as

> "eternal, the heavenly tree which has its roots upward; … its branches extend both downward and upward; … its size so massive, none can understand where it begins, where it ends or where its roots are; … the real form of this tree cannot be perceived in this world."

It is against the background that Vaid wrote:

> "Curiously, while on the tree, the flowers give off a sweet fragrance, but when plucked, they begin to emit a very unpleasant smell. (Incidentally, the puranic descriptions of the flowers of the **kalpa-vriksha** in Indra's paradise do indicate such a 'pleasant-unpleasant' dichotomy in the flower's fragrance depending on the nature of the beholder's thoughts!)" (Vaid 1978a:41)

Sweeney offered a similar account noting that "The flowers are faintly sweet-scented at first … with a carrion smell as they decay" (1974:57). Literature reports of the smell of the baobab flower appear contradictory since from a commonsense point of view it would seem obvious that the flowers must either be fragrant or repulsive, but not both. Wickens and Lowe (2008), for example, describe it as "sweet-smelling" and Palmer and Pitman (1961:231) as "sweet-scented." According to Watson (2007:52), however, "none of the several authors of popular botanical books describing baobab flowers as 'sweetly scented' can ever have smelt them. Perhaps they have been beguiled by the magnificence of the photographed flower into believing it cannot be other than exquisitely perfumed." The flower is indeed more generally regarded as foul-smelling, and Menninger (1967:162), like Watson (2007:52), represents this typical view when he reported that baobab flowers "are extraordinarily malodorous and can keep every sensitive nostril at bay." It is possible that this view prevails because people are more familiar with the fallen flower of the day rather than the living flower of the night as Vaid and others have suggested.

In addition to the traditional religions of Africa and India, the baobab flower has even achieved contemporary relevance. Aided in no small measure by the global reach of the Internet, the baobab flower, used to make a commercial flower essence identified as the baobab flower remedy, has also found its way into New Age spiritual beliefs, practices, and material culture. This diffuse social movement has roots in the 19th century, became widely known in the 1960s, and achieved the status of popular culture in the 1990s leading up to the 2000 millennium. According to Melton (2005):

> "[It] united a body of diverse believers with two simple ideas. First, it predicted that a New Age of heightened spiritual consciousness and international peace would arrive and bring an end to racism, poverty, sickness, hunger, and war. This social transformation would result from the massive spiritual awakening of the general population during the next generation. Second, individuals could obtain a foretaste of the New Age through their own spiritual transformation."

Against this background we can understand the following passage by Anonymous (2015), for whom the baobab flower is "the most evolved part of the plant … [which] therefore contains the medicinal properties of the whole," and this made it "the flower for World Peace." Self-described as "a social activist, astrologist and a reiki master … [who] understands how both heavenly and earthly energies interact with human beings as the co-creators of the Universe," the author wrote:

> "In June 1999 I received a message from a plant spirit to go and make the essence of a beautiful white flower which I saw as a vision in my mind during a meditation … I later found out the flower I had seen was that of the Baobab Tree. I was asked to go in December 1999 to the north of South Africa to make the remedy, and was told that it would help to 'heal the scars of South Africa' and bring black and white people together. The struggle for freedom in South Africa has become a symbol for the struggle more widely in the world to end wars and inequality. The baobab flower essence will be helpful to anybody who wishes to further this cause, as well as those that have been directly and indirectly affected by racism, oppression and war. The essence will help to balance the collective energies of all people in the world … The essence will help people to see how spiritually we are all ONE on the same journey home. The word Baobab means 'the time when man began,' a time where people are increasingly taking responsibility for their own lives, health and the environment rather than relying on governments or other institutions. The success of the journey will mean an end to all forms of war, oppression and ecological destruction as our respect for all life becomes central to our way of thinking. The Baobab Flower Essence is a gift from nature to help humanity on this journey." (Anonymous 2015)

Graphic arts

Writing of Senegambia, Gravette (1999:126) reported that "the sweet-smelling white flowers provide decoration in times of festivals," and according to Wickens and Lowe (2008:122) this use of the flower occurs "in various parts of Africa." Baobab flowers are also used decoratively in at least two tourist establishments in Africa. The Impalila Island [Safari] Lodge in Caprivi, Namibia, features a giant baobab on its grounds, and its website informs us that "food is of prime importance [at the lodge] … and world class cuisine is served on a table decorated with papyrus fronds and baobab flowers." And at a wedding hosted at the Ongava [Safari] Lodge in Mobo, Namibia, the

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cake was described as having "the traditional white icing crowned with porcupine quills and baobab flowers."

In the Americas, the baobab flower has found a place in the graphic arts and recreation, but these uses are highly localized given the general lack of familiarity with the baobab which is an uncommon tree in most territories (Rashford 1987a, 1991, 1992, 1996, 1997b). In the Caribbean the flower is of particular interest to children who live or go to school in close proximity to a baobab.

Jamaica's most impressive specimen, which died for unknown reasons about 15 years ago, grew on the grounds of Alpha Girl's School of the Convent of Mercy Academy in Kingston, the island's capital (Figure 5). This historic tree, which at approximately 3 feet from the ground was 48 feet in circumference when I measured it in June 1986, shaded the entrance to the art room situated to the right of the tree in Figure 5A. Its flowers were used in various art projects both as a subject and as art material, a fact noted by Hawkes (1970). When I visited the school in October, 1986, Sister Irene, who was then the art teacher, said the girls did drawings and watercolors of the flower on the tree, picked from the tree, or collected from the ground, and the flowers were also used to make decorations. With a collage, for example, the flower was disassembled, its parts shellacked to strengthen, preserve, and color them, and then they were mounted on shingles. Sister Irene also mentioned that the girls preferred the "dried flowers" in their projects because the "fresh" ones produce "a horrible odor."

Given the fragile nature of the dried flowers, it was hard to picture them being used for decorations, and the situation did not become clear until I read an article in the school newspaper written by a student named Vanessa Soarez (1977). It is obvious that the students at Alpha Girl's School used the word flower ambiguously to identify both the actual flower as well as the immature aborted fruits whose calyxes give them a flower-like appearance. This confusion occurs because the Alpha Girl's School baobab tree flowers profusely, but the fruits are often aborted before they mature. The small fruit with its long pedicel appears to be the center of the flower with the calyx lobes as its petals. Soarez (1977) wrote:

> "During the year … the tree blooms beautiful white flowers which later whither and turn a brown colour. Then they later fall off the tree along with their stems and are used to make various decorations."

Baobab flowers do not wither on the tree. About 36–48 hours after the flower opens the tree sheds the petals and staminal tube to which the petals are attached.

The only circumstances in which it can be said that the flower actually withers on the tree is when the petals occasionally become hitched on the style passing through the hollow conical staminal tube. When the style of the senesced flower fails to straighten out sufficiently, the corolla/staminal tube is unable to slide over the style and fall to the ground. Instead of falling, the flower remains hanging on the dried remains of the persistent pistil, and often it is also kept in place by the unrolled and lowered lobes of the calyx (Figure 6).

It is well known that the baobab's peak flowering is from mid-spring through summer, and when the confusion became obvious, I was able to understand why Sister Irene said the baobab flowered mostly in September and October and that there were many withered blooms on the ground then. There is no doubt that Sister Irene, like the student Vanessa Soarez, was discussing the small aborted fruits and not the dried flower. I also encountered people—and was told of others—in Antigua, Barbados, and Brazil who collected these aborted immature fruits for dried flower arrangements (Figures 7 and 8).

I was surprised when I began encountering baobab trees in the Caribbean and later in Brazil that flowered profusely but aborted their immature fruit. Just how common this can be is evident in the recognition of "male" and "female" baobabs in West Africa (Assogbadjo *et al*. 2008) and in Swanepoel's 1993 study of the baobab phenology and growth in Zimbabwe's Zambezi Valley. In 1984 Swanepoel began a study of 124 baobabs in the Mana Pools National Park that for various reasons were by 1988 reduced to 88. Of these he wrote:

> "One adult tree never flowered and two other trees only flowered once during the study. Most (84%) mature trees flowered every year. However, no mature seed pods ever developed on any of the trees. Immature pods (less than half the size of normal pods with rudimentary seeds) developed on some trees (11.1% in 1984/85, 22.5% in 1985/86) but did not mature." Swanepoel (1993)

There is only one account from Hawai`i of the decorative use of the baobab flower, and it did not involve the aborted immature fruit. Kendrick (2000) reported that the Garden Craft Club of Honolulu Botanical Gardens, using natural materials gathered from homes and elsewhere, made "philodendron angels" to decorate the botanical gardens of Honolulu during the Christmas holidays. In addition to the philodendron leaf sheaths and the kamani nuts used for the heads, the angels were decorated with baobab petals, Spanish moss, raffia, wood roses, and banyan roots. I wrote to Stephanie Kendrick in July 2005 to learn where the Garden Craft Club got the baobab petals and she responded:

> "At the time of the article, the women were all employees or volunteers at the Foster Botanical Garden in downtown Honolulu and collected the fallen flowers on the grounds there. The baobab tree on site is truly impressive."

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Figure 5. Most impressive baobab (*Adansonia digitata* L.) in Jamaica. (**A**) Alpha Girl's School baobab in Kingston, Jamaica, with the art room to the right of the tree and (**B**) a close up of the trunk.

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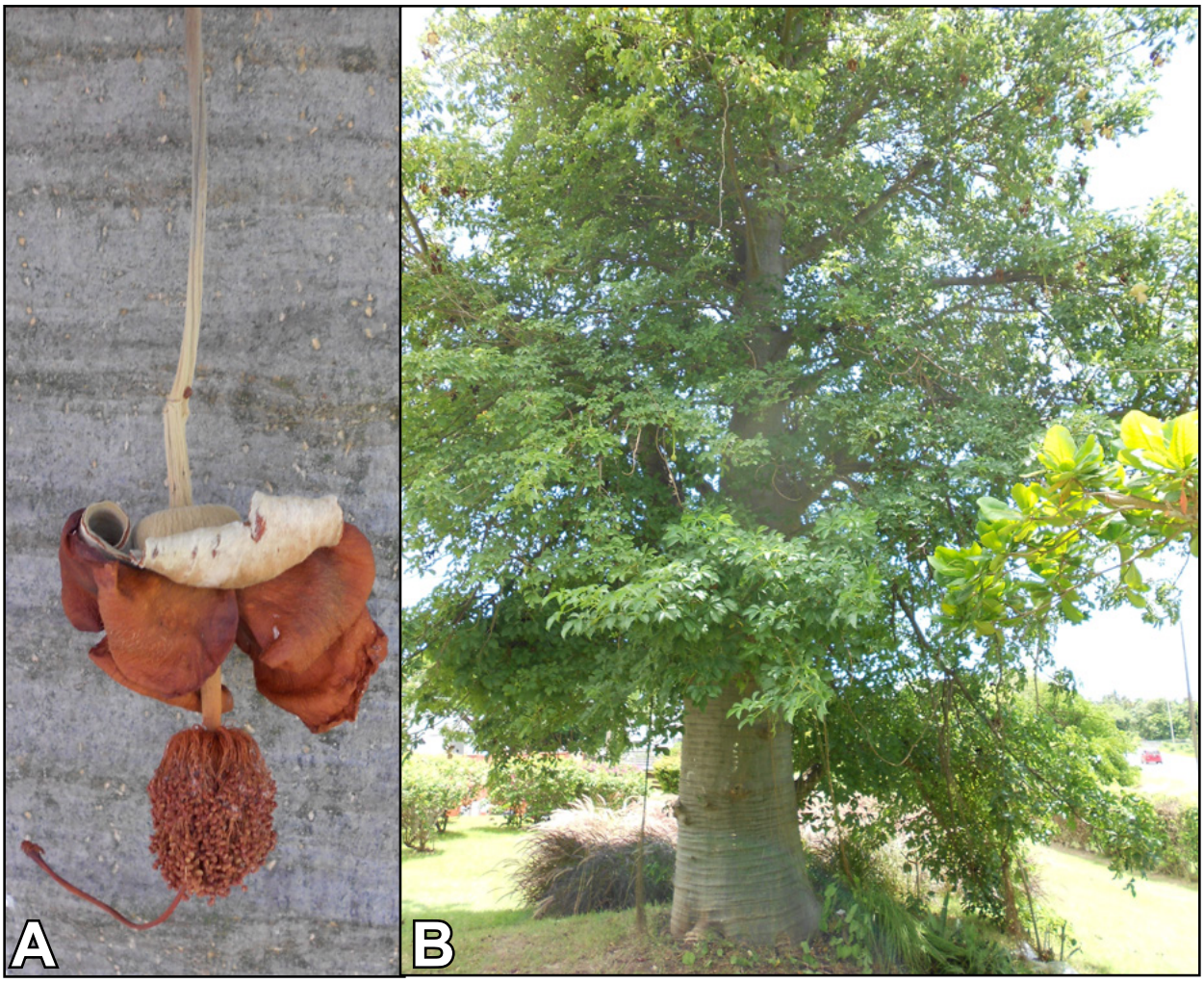

Figure 6. Baobab (*Adansonia digitata* L.) (**A**) hitched flower from the (**B**) Water Company baobab in Bridgetown, Barbados.

Figure 7. (**A**) The St. Johns baobab (*Adansonia digitata* L.) in St. Johns, Antigua, (**B**) the children interviewed, and (**C**) the aborted fruits collected for decorations.

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Figure 8. (**A**) The Queen Park baobab (*Adansonia digitata* L.) in Bridgetown, Barbados, with (**B**) its aborted fruit collected for decorations.

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Recreation

The conspicuousness of the baobab flower, given its size, color, face-down orientation, nocturnal flowering ,and seasonal abundance, is not only the basis for its appeal as a curiosity and ornament. It is also the basis for its recreational use in the Caribbean and Africa. At the Alpha Boy's School, which occupies the northern part of the Convent of Mercy Academy, there was also a beautiful baobab (Figure 9) that in June 1986 was 33 feet in circumference measured at 3½ feet from the ground, and this tree, unlike the one at the Alpha Girl's School, did develop its fruit (Rashford 1987a, 1997b).

The boys ate the fruit pulp and seeds, and they also used the fallen flowers recreationally (like those of the oleander, *Nerium oleander* L.) to play a game called "keep up" or "seaway lash." They competed to see who could bounce a single flower up and down on the top of the foot the most times. In my 1987a article I wrote the following of my first encounter with the tree in Alpha Boy's School baobab in June 1986:

> "Unfortunately, a good third of the tree which had grown over the roof of one of the buildings had been chopped off sometime between the end of April and the beginning of May 1986, and the pieces, some of which were quite large, were strewn all around the base of the tree."

The tree did not survive the massive limbing, however, and died shortly thereafter.

Another recreational use of the baobab flower in Africa and the Caribbean is to make a doll. According to Watson (2007:147), a

> "woman who owns the Baobab Café in the Old Town of Zanzibar remembers creating dolls out of baobab flowers, petals making up the skirts and stamens the hair. Sometimes she would spend hours plucking pollen from the stamens, and end by whispering to her flower-doll, 'Pretty baby, your hair is now clean.' In the town of Parham, Antigua, the children also used the fallen flowers to make a toy they call 'dolly.'"

They removed the petals from the staminal tube and then placed the hollow tube upside down on their index finger. The many limp filaments fall over the tube giving the appearance of a head and face covered by hair. This is the origin of the name "dolly," and this is also the name they gave the baobab—"the dolly tree" (Figure 10). The few fruit I was able to collect from the tree on the day I made my first visit had very little fruit pulp, and the young boy I

Figure 9. Baobab (*Adansonia digitata* L.) at Alpha Boy's School in Kingston, Jamaica, that died after it was severely limbed to protect the zinc roof of the building next to it.

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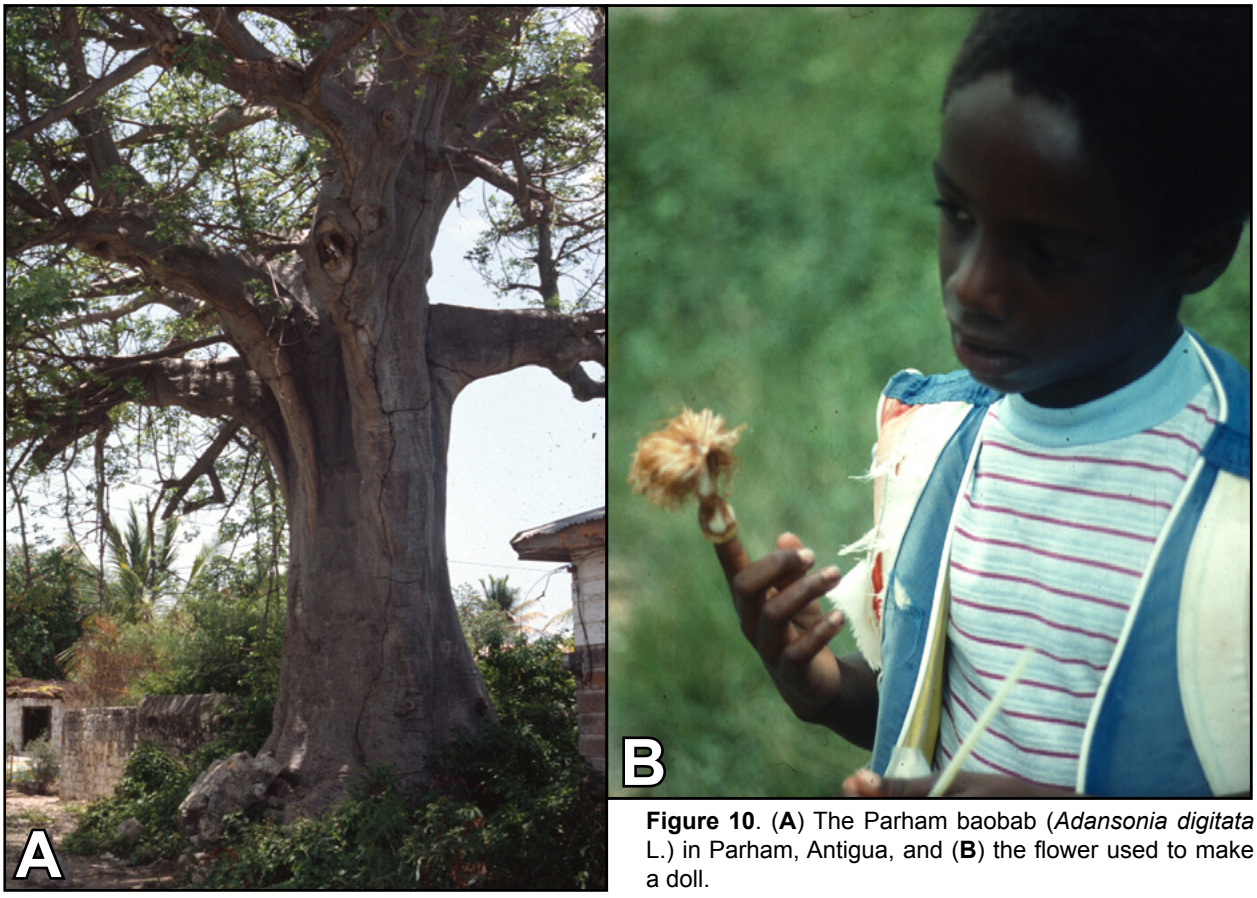

Figure 10. (**A**) The Parham baobab (*Adansonia digitata* L.) in Parham, Antigua, and (**B**) the flower used to make a doll.

spoke to in the photograph said the only use they made of the fruit was the pod which they cut in half longitudinally to make a boat. This is probably the reason why, unlike other Caribbean islands and a similar occurrence in India, they did not have a tamarind name for the baobab (Rashford 1994, 1997a).

Conclusion

Summarizing what was known of baobab in the 1980s, Wickens (1982:174) noted that "for such a well-known tree there are surprisingly large gaps." This was certainly true of the flower then, and it remains true today. One important reason for the limited attention to the use of the flower is that the now-extensive literature on the tree has largely focused on the botany of the baobab and its practical uses rather than its inspirational value. In a more holistic approach we must also explore the flower's association with religion, oral traditions, and recreation. This synthesis of the uses of the baobab flower that incorporates the results of my own fieldwork on the introduction and cultural significance of the baobab in Florida, the Caribbean, and Brazil has shown that the flower is indeed useful, but it is not intended to be the final word on the subject. As a preliminary assessment we can tentatively conclude that the flower is inspirationally valued for its aesthetic appeal as a curiosity and ornament in Africa, the Americas, and India, but only in Africa is the flower of both practical and inspirational value. In Africa the flower's inspirational value is also related to oral traditions, religion, and recreation, while in India it is related only to religion and in the Americas to the graphic arts and recreation. If it was possible for Goody (1993) to overlook the presence of one of Africa's most extraordinary trees and its singular flower we can understand that it is also possible for others to have overlooked the uses of the flower. What this paper hopes to make clear is the need for additional studies that will bring to light the full traditional and contemporary significance of the baobab flower in Africa and in other parts of the world.

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