

Papaya

Carica papaya (Caricaceae)

by Daniel B. Ward



The Papaya (*Carica papaya* L.) is a small unbranched tree sparingly cultivated in southern Florida and found rather commonly in wild situations throughout the Keys, on islands of the Everglades, and sometimes on aboriginal shell middens as far north as the Ten Thousand Islands of Collier County on the west and Turtle Mound, Volusia County, on the east. It has been unqualifiedly considered a native by some authors (West & Arnold, 1946) and equally firmly marked as non-native and stated to be “escaped from cultivation” by others (Wunderlin, 1998).

The determination of whether *Carica papaya* is native to Florida, or a recent introduction from cultivated sources, is important. If believed to be non-native, the little tree may be perceived by land managers as an unwelcome invader in the Florida flora and will be subject to eradication from protected natural areas throughout the state. If considered a part of our native flora, that status will give it protection and its presence on state lands will add interest as a link with the earliest human inhabitants of the Florida peninsula.

Papaya is a distinctive plant, with its spindly trunk topped by a crown of large, palmately-lobed leaves, below which are small cymes of yellow flowers or a few broadly elliptic, longitudinally-ridged fruits borne close to the stem. The fruits – sliced crosswise at maturity, seeds scooped from the center, leaving the delicately fragrant, smooth textured, sweet pulp – are a culinary delight. Thus it is most unlikely that early explorers with descriptions in their books, even if unfamiliar with the plant from personal experience, would confuse it with any other.

Bartram

The first Florida venturer to mention the Papaya was the Philadelphia naturalist, William Bartram. His father, John Bartram, who in 1765 traveled with his son “Billy” along the St. John’s River and elsewhere in Florida, made no mention of Papaya or *Carica* in his detailed diary (Harper, 1942). But nine years later,

William returned, and traversed much of the same Florida wilderness. In the spring, and again in the late summer of 1774, he boated up the St. Johns River, camping on the shores either alone or with a companion, and experiencing the adventures with bellowing alligators, schooling fish, and clouds of birds that made his later *Travels* (1791) such a literary and natural-history classic.

“And now appeared in sight a tree that claimed my whole attention: it was the *Carica papaya*, both male and female, which were in flower, and the latter both in flower and fruit, some of which were ripe, as large, and of the form of a pear, and of a most charming appearance. This admirable tree is certainly the most beautiful of any vegetable production that I know of; the towering Laurel Magnolia and exalted Palm indeed exceed it in grandeur and magnificence, but not in elegance, delicacy and gracefulness; it rises erect with a perfectly strait tapering stem, to the height of fifteen or twenty feet, which is smooth and polished, of a bright ash colour, resembling leaf silver, curiously inscribed with the footsteps of the fallen leaves, and these vestiges are placed in a very regular uniform imbricated order, which has a fine effect, as if the little column were elegantly carved all over. Its perfectly spherical top is formed of very large lobe-sinuate leaves, supported on very long footstalks....The ripe and green fruit are placed round about the stem or trunk....The tree very seldom branches or divides into limbs, I believe never unless the top is by accident broke off when very young....” (Travels, 1791:131-132).

Bartram apparently also kept a journal, now lost, from which he prepared a series of reports to Dr. John Fothergill, London, who had financially supported his journey. His reports to Fothergill have survived, and have been published (Harper, 1943). They are less lyric and more detailed than *Travels*, but often permit a reader to gain better understanding of the epic journey into the Florida wilderness.

The financial stimulus from Dr. Fothergill, is, of course, not referred to in the *Travels*, and is consequentially little known. It is detailed in a letter written 23 October 1772 by Fothergill to Dr. Lionel Chalmers of Charleston (Harper, 1943:126). “Another person...claims a little of my assistance.... He is the son of that eminent naturalist John Bartram of Philadelphia, bound to merchandize but not fitted to it by inclination....He knows plants and draws prettily. I received a letter from him this summer from Charleston, offering his services to me in a Botanical journey to the Floridas....Lend him any assistance that may seem expedient at my expense.... I was thinking to give him Ten guineas, to fit him out with some necessaries....and to allow him any sum not exceeding 50 [pounds] pr Ann for two years....In consideration of this sum, he should be obliged to collect and send to me all the curious plants and seeds and other natural productions that might occur to him....I would wish to encourage [him], not to injure him by proposing a provision that may make him idle.”

In his report to Fothergill, Bartram spoke only briefly of Papaya. Once, in a listing of useful plants, he noted, “The Floridians eat this fruite when ripe.” Elsewhere he observed “Indian Papaya, profusely adorn’d with garlands of joyfull airey Climbers.”

Presumably the observations detailed in his *Travels* and the brief comments in the Fothergill report are of the same location. His descriptions of natural landmarks both before and after the Papaya sighting permits us to be confident that he encountered the tree somewhere along the upper St. Johns River, along the eastern border of Lake County, between the present town of Astor (then a trading post) and Lake Beresford.

Much of the St. Johns waterway is bordered by extensive marshes, where *Carica* would not thrive. But immediately before his mention of the Papaya in the *Travels* he noted, “The banks of the river on each side began to rise and present shelly bluffs.” “Shelly” indicates Bartram’s site may have been an aboriginal midden, which in turn suggests the Papaya had reached that location via human transport. [The inhabitants, until destroyed by the invading Creeks (our Seminoles), were the Timucua, who had also planted many acres of sweet and sour oranges received from their masters, the Spanish of St. Augustine.]

Michaux

In 1788 the French botanist, Andre Michaux, with guidance following a visit to Bartram in Philadelphia, retraced much of the earlier explorer’s route. He too found *Carica*, though his description was disappointingly brief. On March 12 he and his party (his son, his black servant, and two oarsmen) left



Carica papaya – photo by Marjorie Shropshire

St. Augustine by canoe, proceeding south along the Matanzas River. By March 22 they had reached the Halifax River and Ponce de Leon Inlet (then called Mosquito Inlet), Volusia County. They camped “on dry ground at 4 Miles distant from the mouth of Spruce Creek” (Taylor & Norman, 2002:70, in trans.), apparently a short distance south of the Inlet. Michaux’s diary simply noted, “There I found *Carica papaya*.”

[The longstanding puzzlement of why a central Florida stream would bear the name “Spruce Creek.” when no *Picea* is known south of North Carolina, is hereby resolved. A 1769 map (Taylor & Norman, 2002:44) shows it as “Spruce Pine Creek.” “Spruce Pine” was long given to *Pinus clausa* until persnickety botanists reserved that common name for the more northern *Pinus glabra*, assigning “Sand Pine” to the abundant peninsular conifer.]

Present Distribution

It is apparent that Bartram’s observation on the St. Johns River in 1774 and Michaux’s comment along the Halifax River in 1788 could not have been of the same location. They were

on different waterways, separated by perhaps 30 miles across almost the entire width of Volusia County. One may speculate that the tree was then sufficiently common as not to merit mention, for Bartram boated past Ponce De Leon Inlet with his father in 1765 and again in 1774, and Michaux in May 1788 traveled much of the same St. Johns waterway as had Bartram, yet neither mentioned *Carica* at the place it had been seen by the other.

For the last century Papaya has been gone from both Bartram's St. Johns River location and the site on the Halifax River where seen by Michaux. However several small trees are present today, atop nearby Turtle Mound, a large Timucuan midden 9 miles south of New Smyrna, Volusia County. When Michaux visited Turtle Mound – which he knew of as Mount Tucker – five days after leaving the Papaya location near Ponce De Leon Inlet, he noted that he collected there “several shrubs and plants of the Tropics,” but made no mention of Papaya. Turtle Mound was not again visited by a botanist until J.K. Small (1923:203) reported that in 1921 “Papaya (*Carica*) was there in its wild state, evidently brought up the coast by migratory birds.” When E.M. Norman (1976) inventoried plants of the midden in the early 1970s, she recorded Papaya as “rare.”

On the southwest coast of peninsular Florida, *Carica papaya* is also present atop the steep-sided shell middens of the Ten Thousand Islands just south of Everglades City, Collier County (as seen in January 1996). The trees are few, overtopped by the thick tropical vegetation that now covers the aboriginal sites, and give the impression of marginal survival.

Papaya has been reported from the southwest coast since its discovery by A.W. Chapman, a physician and amateur botanist of Apalachicola. In the mid-19th century Chapman traveled at least twice to southern Florida to add tropical species to his herbarium. About 1876 (the date is uncertain, though it probably could be determined from his collections at the New York Botanical Garden) he visited what is now Collier County, and published a lengthy listing of his discoveries (Chapman, 1878). He perhaps saw the tree on or near Marco Island (he noted Caximbas Bay for several collections probably obtained on the same trip), 25 miles northwest of the Ten Thousand Islands area. Regrettably, he limited his report to a botanical description, merely noting the tree was from “South Florida.”

Southwest coastal Florida was the ancestral home of a quite distinct aboriginal culture, that of the Calusa. Unlike the Timucua, the Calusa were consistently hostile to the Spanish and had less opportunity to obtain plants from that source. It is quite possible the Calusa had obtained their Papaya directly from trade sources in the Caribbean. But here, too, the date of that transport is not made clear from the mere

existence of plants surviving on their shell middens.

Papaya is also present throughout the Everglades and Florida Keys, always in hammocks, never in the open prairies. It was infrequent, occasionally encountered but never in appreciable numbers, until Hurricane Andrew swept over the area in August 1992, crushing and removing the trees and shrubs from many hammocks. The following season *Carica* seedlings appeared in great numbers throughout the area, indicating the seeds had lain dormant in the soil for many years (W. S. Judd, pers. obs., Sept 2003). One speculation, that they perhaps represented Indian campsites, was discounted by the widespread and diffuse distribution of the seedlings.

The Everglades Papayas, as they matured and bore fruit, displayed a characteristic that reflects on their origin. The fruits were small, the size of golf balls or eggs, much smaller than those of modern cultivated strains.

Carica papaya is known in the state far more widely than these records indicate. Herbarium records are available for 13 South Florida counties (R.P. Wunderlin, pers. comm., 1996). Yet many of these additional records are of plants recently escaped from cultivation – most have large, commercial-sized fruits – and give us no information as to the origin of plants on the aboriginal sites.

Origin of Papaya

Papaya is a member of a smallish (perhaps 40 species) genus native to tropical and subtropical America. *Carica papaya* itself has never been found wild, but is believed to have originated in southern Mexico and Costa Rica where close relatives occur. Most strains are dioecious (male and female flowers on different trees). The tree is an important tropical fruit, but travels poorly, so is little known far from its origin. (See Purseglove, 1974; Rehm & Espig, 1991.)

How did Papaya come to be in Florida? The first possibility, that it was carried here by ocean currents, is improbable. The fruits do float, though there is no data on seed survival with exposure to seawater. Ocean transport has the further burden of explaining how the battered seeds would reach the more upland, mesic soils necessary for their growth. Further, the dioecious sexual structure reduces the odds even more, for a single surviving plant would be ineffective, the male naturally sterile and the female unpollinated and thus infertile.

The second possibility, human transport, thus becomes a near certainty. But concluding that *Homo sapiens* was the vector tells us little. It is also essential to determine the *date* of transport – either pre-European contact, and thus native, or post-European contact, and thus introduced. That distinction has been discussed in the first number of this series (Ward, 2003). Thus the objective

of this essay is to determine whether Papaya was brought to Florida by the early aboriginal peoples at some indeterminate time in the past, or given to them by the Spanish in the early years of their colonization of the peninsula.

It is clear the Papaya was available for transport and cultivation by the aboriginals – the Timucua in the St. Johns River area, and the Calusa in the Southwest. But did they bring the fruits and viable seeds from a Caribbean source closer to the tree's area of origin? Or did they perhaps obtain it from the Spanish of St. Augustine, and move it together with oranges into areas far outside Spanish settlement and direct influence?

Solid Evidence

At last evidence is in hand. For some years a series of excavations has been underway on Pine Island, just inland from Sanibel Island, Lee County. The Pineland Site Complex is acknowledged as a remarkable deposit of early settlement and is listed in the National Register of Historic Places. Before protection was attained, parts of the mounds on the site were removed and low areas filled, thus limiting the scope of modern excavation. Even so, a wealth of artifacts has been recovered, as well as abundant animal and plant remains.

Radiocarbon dating of materials from Pineland show cultural periods from A.D. 50 to A.D. 1750. The waterlogged deposits in which most plant materials were found were early in this series, from the first through the third centuries A.D. Fragments were recovered of fleshy fruits, as well as species of wetland, woodland, and hammock taxa (Marquardt & Walker, 2001). Among these materials were nearly 3,000 seeds of various species.

Only 8 seeds of *Carica* were found among the many recovered seeds. Yet their presence and form answers much. In size, texture of seed coat, and overall morphology, these seeds were somewhat different from Papaya seed from elsewhere, suggesting that there had been some selection by the Pineland residents (L.A. Newsom, pers. comm., Aug 2003). But they were indubitably Papaya. There can now be no question that this species was introduced to Florida by the early inhabitants, probably the Calusa, no later than 300 A.D., vastly predating European influence. The Papaya (*Carica papaya*) is thus confirmed to be a native member of the Florida flora.

I wish to thank Walter Judd for his acute observations of Papaya in the Everglades and realization of the significance of their distribution and fruit size, to Lee Newsom for her generosity in providing information on her Pineland discoveries in advance of her own publication, to Karen Walker and Bill Marquardt for their recent Pineland data, and to Richard Workman for his constant interest and significant help in the search for a definitive answer to Papaya's nativity.

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