

The Origin, Indigenous Range, and Dissemination of the Avocado

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A person traveling in a foreign land sometimes hears myths, legends, bits and pieces of lore, conjectures, speculations, hypotheses, theories, and beliefs about the fruits native to (or naturalized in) that land. Much of the lore and conjecture have never found their way into the literature. This is true of the avocado in Mexico, Central America, and the northern countries of South America.

When Spaniards began extensive explorations in both North and South America after their discovery, the avocado tree was being cultivated for fruit by various peoples all the way from central Mexico to northern Peru. The consensus among botanists and ethnologists is that it spread southward from a center of origin in or near southern Mexico.

Lucille E. Kopp wrote "A Taxonomic Revision of the Genus *Persea* in the Western Hemisphere (*Persea-Lauraceae*)", which was published in *Memoirs of the New York Botanical Garden* in 1966. With reference to the avocado (*Persea americana*), she said: "The species probably originated in the Chiapas (Mexico)-Guatemala-Honduras area where the 'wild avocados' are found. Its origin is obscure because of its close connection with representatives of early civilizations of the area who valued its fruits. It is, therefore, a problem in ethnobotany."

The avocado, like corn (*Zea mays*), date (*Phoenix dactylifera*), fig (*Ficus carica*), tobacco (*Nicotiana tabacum*), and sugar cane (*Saccharum officinarum*), is what is known as a "cultigen"; that is, it is a cultivated species which was domesticated so far back in antiquity and has undergone such drastic transformation under prehistoric human selection that its ancestry is unknown.

Plant distribution and taxonomic evidence are compatible with the assumption that the avocado did originate in south central Mexico or nearby. Possibly the genus *Persea* itself originated in this general area; we do not know. Nor do we know what the ancestral prototype was like. Whatever it was, it spawned a whole galaxy of species along divergent phylogenetic lines. One of these lines culminated in *P. americana*, the commercial avocado.

At present, over 80 species of *Persea* are recognized as valid. Nearly all have tiny fruits lacking palatable flesh. Nearly all are native to the Americas. The species are scattered from Mexico north through the southeastern United States, east through the West Indies, south through Central America, Colombia, Venezuela, the Guianas and Brazil, and Ecuador, Peru, Bolivia, and Chile. How one species (*P. indica*) got to the Canary, Madeira, and Azores Islands, and how several that may be *Persea* got to southeastern

Asia, is problematic.

Common Names

Transliterated into the language of today, the original Aztec name for the avocado is *ahuacatl*. This name is still used in parts of Mexico where the Aztec language has not been entirely replaced by Spanish. Their word for tree is *quahuitl*. So the avocado tree becomes *ahuacaquahuitl*. This word can be expressed by a logogram ("picture writing") depicting a stylized avocado tree. In the trunk of the tree can be inserted a tooth-like hieroglyphic representing the Aztec word *tlan*, meaning location. Thus, the whole picture reads "location of avocado tree(s)," or "place where the avocado abounds." This stylized picture was adopted as the symbol of the California Avocado Society early in its history, and has graced either the cover or the title page of the C.A.S. Yearbook continuously since 1941.

In ancient Mexico there were at least two towns named "Ahuacatlan." Today, from the United States border south to Panama, our avocado is universally referred to as *ahuacate* - - usually corrupted slightly to *aguacate*.

Farther south, in Peru, it has long been known as *palto* (the tree) and *palta* (the fruit). The name came from an Amerindian tribe in what is now eastern Peru, who were growing it in pre-Columbian times. So it must have gotten to that region very early. But botanical, ethnological, and archeological studies all indicate that it was not indigenous there.

As the fruit was carried elsewhere, it acquired local vernacular names, most of them derived from *ahuacate*. The nearly universal *avocado* of English-speaking people is one such corruption. (Rarely, one still encounters "avocado pear"; it is not related to true pears, many fruits are not pear-shaped, and in any case, the second word is quite unnecessary.) In French-speaking countries, it is *avocatier*. Among Dutch-speakers, *avocaat*. In Trinidad and Tobago, *zaboca*. In Jamaica, it was variously referred to as *avocado*, *avocato*, *avacato*, *avigato*, *albecata*, or the rather repugnant *alligator pear*.

The latter, Antillean names, remind us that the avocado was not native to the West Indies, but was brought there only post-Spanish conquest, bringing with it corrupted mainland names — which were promptly given further local corruptions.

The Three Avocado Races

In the course of time, the primitive *avocado*, *P. americana*, evidently gave rise to three, and probably more, divergent types which, developing in geographical isolation from one another, became distinct botanical types. These became known in horticultural circles as three races: Mexican, Guatemalan, and West Indian. To systematic botanists, they are botanical varieties. They are designated as *P. americana* var. *drymifolia*, var. *guatemalensis*, and var. *americana*, respectively. Probably the "species" *P. floccosa*, *P. nubigena*, and perhaps even *P. schiedeana*, are actually botanical varieties of *P. americana*, also. The Mexican race, *P. americana* var. *drymifolia*, is thought to be the primordial race of commercial avocado. One of us (G.A.Z.) has collected very primitive

forms of it in pine and oak forests of Nuevo Leon state of northeastern Mexico. These had fruits about 2 cm (3/4-1") in length. Similarly, primitive Mexican forms have been noted farther south, also at higher elevations — in Michoacan state, and on the lower slopes of the volcano Orizaba, Vera Cruz (Figure 1).

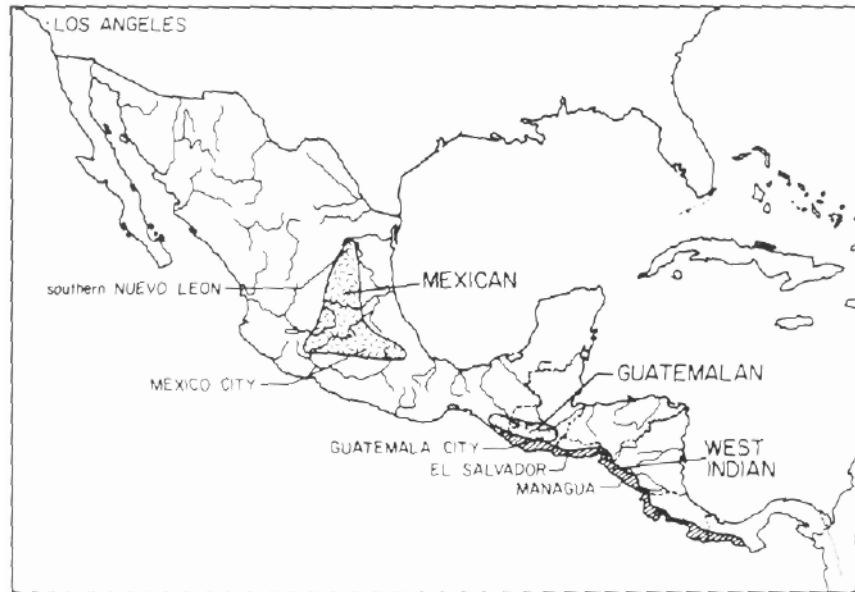


Figure 1. Possible centers of origin of the three avocado races.

The Guatemalan race apparently developed in the highland region of Guatemala north of Guatemala City and Antigua. That the Mexican and Guatemalan races developed in the highlands of Mexico and Guatemala, respectively, is now accepted almost universally. The center of development of the West Indian race is obscure; but, as we shall see later, the most likely locale seems to be the Pacific Ocean lowlands from Guatemala through Costa Rica.

C. E. Smith reported in 1966 that seeds recovered from cave deposits in El Riego, Purron, and Coxcatlan in the Tehuacan region of Mexico southeast of Mexico City, indicated that avocado consumption and perhaps culture has been going on for thousands of years. Carbon-14 dating indicated that by 7000 B.C., natives were collecting fruit and carrying it into their caves. And purposeful planting may have begun about 6500 B.C. Smith further believed that conscious selection for better fruit horticultural quality of the seeds to be propagated began by 900 B.C., but his evidence for this is questionable.

However it came about, in geographical isolation and presumably with some human guidance, the three ecological types that are cultivated as horticultural races gradually diverged, acquiring distinctive traits. Such traits made them individually valuable to the different climates of the world's avocado enterprises.

Genetic evidence supports the theory that the three races are but variants of a single species. All representatives have the same somatic chromosome number, $2n = 24$. They hybridize readily. In fact, where two races have been brought together in

cultivation they soon mongrelize, and racial distinctions disappear. In 1949, Wilson Popenoe noted that considerable hybridization had occurred in the Atlixco region of Mexico, home of the Mexican race, when Guatemalan avocados were introduced. The two most important Mexican x Guatemalan hybrids selected there were 'Puebla' and the mighty 'Fuerte,' but there are many others which are less noteworthy. Many Mexican x Guatemalan hybrids in various mixtures have originated in California, but only 'Bacon,' 'Zutano,' and 'Pinkerton' have become important commercially. Some of the most important commercial cultivars in Florida are Guatemalan x West Indian hybrids. Among them are the leading 'Booth 7,' 'Booth 8,' and 'Lula.' Many Guatemalan x West Indian hybrids have originated in Hawaii also, virtually all descendants of a single Guatemalan tree, the 'Macdonald.' Some of these cultivars are 'Beardslee,' 'Ilialu,' 'Kahaluu,' 'Fujikawa,' and 'Nishikawa.' Mexican x West Indian hybrids have been produced in Florida and California, but none has become important commercially.

Systematic botanists and ethnobotanists agree that the avocado was unknown off the continental mainland before discovery of the New World by Columbus. None of the early chroniclers of voyages in the West Indies mentioned it, and the various tribes of Amerindians inhabiting the islands had no native name for it,

The West Indian Race

In spite of its misleading name, this, the most tropical of the three races, has been assumed to have developed somewhere in the hot and humid lowlands of Central or northern South America. But that covers a lot of ground, including two continents and frontage on two different oceans. For a number of reasons, we consider the most likely region of origin to be the Pacific lowlands about 82° to 92° west longitude (Figure II). We develop our analysis with the following points.

1. As we have seen, the avocado was apparently unknown to the pre-Columbian residents of the West Indies; they had no name for it and instead used corruptions of the Mexican name when the avocado was eventually introduced. Moreover, chroniclers and botanists on the early exploration of the West Indies do not mention the avocado.
2. If it had developed on the *east* side of the continent, it would surely have spread into the nearby West Indies long before the European era, during its lengthy existence as a valued food commodity.
3. Similarly, the early chroniclers and botanists never reported avocados in northern, tropical, South America. This makes highly unlikely the suggestion in 1976 by Bergh that primitive forms of the West Indian race in lowland Columbia may point to that area as its center of origin. And a Columbian origin also would have made early introduction to the West Indies probable.
4. The avocado was disseminated through the Caribbean region only after Balboa crossed the Isthmus of Panama in 1513 and discovered the Pacific.
5. Spanish galleons crossing the Pacific from the western coast of Central America and Mexico introduced the avocado (West Indian race) to the Philippines. Later, ships from Europe bound for the Hawaiian Islands would go around Cape Howard, then replenish supplies along the same western coast before completing the trip; likewise

including avocados in their foodstuffs, they introduced the avocado to the Islands about 1823 and again in 1853. (These also were of the West Indian race; not until 1896 was a second race introduced, the Guatemalan — three seeds by Admiral L. A. Beardslee.)

These five points together provide overwhelming circumstantial evidence that the West Indian avocado race originated in North America rather than South America, and on its west rather than its east coast. To make all observations fit together, we need only make two further assumptions. First, that there was little pre-Conquest social intercourse, or at least movement of plant foods, among the tribes in the region from Mexico to South America; otherwise, all three avocado races should have been much more widely distributed. Second, that the mountains of Central America served as an additional barrier to plant movement; otherwise, the West Indian race should have spread the relatively short distance from the west to the east coast, where it is equally adapted.

A corollary of this second assumption is the deduction that West Indian avocados did not originate in the Panama region (although the genus *Persea* with *P. americana* as type species was founded on West Indian race specimens collected in Panama); otherwise, they should have spread to the Caribbean and South America long before the Conquest. That leaves long stretches of usually narrow tropical lowlands along the Pacific from Panama north-west to southern Mexico, and possibly even the Mazatlan area. However, considering the distribution of the other *Persea* races, plus a primitive West Indian type found in eastern El Salvador by Zentmyer and Schieber in 1977, we would suggest coastal Guatemala through Costa Rica (Figure 1) as the best guess at this time for the region of origin of the West Indian race of avocados.

We note in passing that additional reasons have been suggested for the limited pre-Conquest movement of the three avocado races in general and the West Indian race in particular: the relatively large size of the avocado seed, and especially its quick mortality under drying conditions. We do not believe that these impediments compare in importance with the factors previously noted: limited plant movement between the native tribes, and the mountainous physical barrier between the two ocean lowlands.

Parallel Evidence from Papaya

Other New World fruits also had surprisingly limited distribution at the time of the Conquest. Examples include the pineapple (*Ananas comosus*) of Brazil, the cherimoya (*Annona cherimola*) of Peru and Ecuador, the Guava (*Psidium guajava*) of northern South America, the mamey or mamee apple (*Mammea americana*) of the West Indies, and the papaya (*Carica papaya*). For all of them, the most reasonable explanation is the combination of tribal isolation and mountain barriers cited above for the avocado.

The case of the papaya is especially instructive. Like the avocado, it originated on the American mainland somewhere north of South America. Unlike the West Indian avocado, it originated on the Atlantic instead of the Pacific coast. At the time of the Conquest, it was cultivated by natives all the way from the Isthmus of Panama to the present state of Chiapas, Mexico. It was generally known as *olocoton*.

Even as the avocado was unknown to the peoples of the Caribbean coast in pre-Columbian times, the papaya was unknown to the peoples of the Pacific coast. Both were unknown to the inhabitants of the West Indies and northern South America. It was introduced from Panama into Hispaniola (Haiti-Santo Domingo) in 1521 by Alonzo de Valverde. There it acquired the Carib Indian name *ababai*, soon corrupted into *papaia*, *papia*, *papeya*, and — *papaya*. From Hispaniola it quickly spread to other West Indian islands, including Jamaica, where it became known as *papaw* or *pawpaw*; to Cuba (*fruta bomba*); to Venezuela (*lechosa*); to Brazil (*mamao*); and to Argentina (*mamón*).

The papaya was unknown on the Americas' Pacific slope until after Panama City was founded in 1519, subsequent to Balboa's momentous crossing of the Isthmus. Only in 1526 was the papaya taken to the Moluccas (Indonesia), whence it spread with commercial importance throughout the East Indies and tropical Asia.

Papaya seeds are small and, even when dry, remain viable for several months. Both traits contrast with the avocado, and both should provide dissemination benefits.

Yet, the papaya was as effectively limited in pre-Conquest distribution as the avocado. Both were kept from relatively nearby regions where they would have thrived and where they would have been prized for food. The overriding significance of barriers imposed by geography-climate (mountains) and nationalistic blocks (tribalism) is evident.