
1 Olive tree history and evolution

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1.1 Introduction

The olive tree, *Olea*, derives its name from the Greek word *elea* and is one of the oldest known cultivated trees in the world. It seems possible that when man first cut wild olive tree branches to kindle a fire or to use them as a weapon, he noted its potential uses as well. It is possible that when the cut branches were left partly covered on the ground, they sprouted and after a long time grew into wild olive trees. The “taming” of the wild olive and the emergence of the cultivated olive tree represent the triumph of a developing civilization (Kiritsakis, 1998). The olive tree has been cultivated for about 6000 years in the Mediterranean basin. Unquestionably, the cultivation of the olive tree began before the written word was invented.

Archaeological studies indicate that the original centers of olive cultivation were in Syria, Israel, Lebanon, Cyprus, and Crete. Paintings found in the Minoan palace of Knossos on Crete early in the 20th century show people consuming olives and using olive oil for cooking and as fuel in lamps. Huge clay containers (amphoras), used for the storage of olive oil in ancient times, exist even today in Knossos and Pheostos. Many archaeologists believe that the wealth of the Cretan Minoan Kingdom (3500–1000 BC) was due to the successful trade in olive oil. Olive tree cultivation was spread from Crete to the rest of Greece. Around 600 BC, the olive tree was brought to Italy and to other Mediterranean countries from Greece or from North Africa. The olive tree was probably introduced to Spain by Greeks, Romans, and Arabs. Rome expanded olive cultivation to the entire Roman Empire under occupation. The olive tree was widely cultivated in southern Europe, and this is where the name *Olea europaea* comes from.

After the discovery of the North American continent, the olive tree was brought there by the Spanish settlers. Olive trees were first planted in California around 1800 AD, when seeds or cuttings were brought to San Diego by the Franciscan padres. In the earlier days, the cultivar from the San Diego Mission was the leading one in California. Despite the fact that Americans have also developed an olive oil–based cuisine, the local supply is still inadequate. In the 1930s and 1940s, many Californian olive groves were grafted to produce table olives, rather than oil olives. Thus, today California supplies only a small percentage of the olive oil consumed in the United States. Arizona is another state with commercial acreage planted with olive trees.

In modern times, the olive tree has been spread all over the world and has been successfully cultivated in many regions previously not known to have olive trees. Olive trees are now being grown commercially in about 30 countries located mainly between latitudes of 30° and 45°. However, the Mediterranean basin, which was its ancient home, has the largest number of olive trees and is still the main source of olive oil in the world.

1.2 The olive culture in the Mediterranean region

According to legend, the olive tree was a gift from the gods to the ancient Greeks. Historian Herodotus described Athens in the fifth century BC as a vast center of olive culture. Philosopher Aristotle elevated

2 Olives and Olive Oil as Functional Foods

olive cultivation to a science. The olive tree was a spiritual treasure for the Greeks. Olive branches dipped in purified water were used in funeral ceremonies. A special wreath, made of olive branches wrapped with wool, was carried by singing boys during harvest festivals. The crowning wreaths (*kotinos*) for the winners of the ancient Olympic games, which were held at the Greek city Olympia, were made of a wild olive tree branch. Victorious athletes also received olive oil in a cup.

The olive tree was a symbol for the Romans just as it was for the Greeks and other nations. Romans and Greeks developed all aspects of olive cultivation, production, and processing. It was the Romans who invented the screw press (hydraulic press) for olive fruit processing, and that procedure remained mostly unchanged for about 2000 years. Rome realized the significance of the olive tree in Africa and boosted its cultivation there. Romans considered those who used animal fat instead of olive oil in their diet to be barbarians. Olives were considered as one of the most useful and delectable fruits, like figs and grapes. Unquestionably, olives and olive oil were the most valuable products in ancient times.

Olive oil, besides being a fatty nutrient, always had other various uses. It had a special place in the Orthodox Church ceremonies, and it was used for the consecration of the Orthodox priests and of the kings of Greece. In biblical history, the olive tree played its role. Noah, after the waters of the flood receded, sent a dove out from the Ark. The dove came back carrying an olive branch in its mouth, and the olive tree was recognized as the symbol of peace thereafter.

The olive tree also played an important role in the decoration of pottery and of murals on the walls of houses. The olive tree has great historical importance because of the antiquity of its culture and the extent of its influence upon the development of Western civilization. It is not a coincidence that Romans, Greeks, Syrians, Egyptians, Israelites, Arabs, Babylonians, and many other people in ancient history were considered to be “children of the olive land” and were nourished by the fruit of the olive tree.

Many olive cultivars have been developed over the centuries. Four of the cultivars most commonly used for oil production are ‘Koroneiki’ in Greece, ‘Frantoio’ in Italy, ‘Arbequina’ in Spain, and ‘Mission’ in the United States. Olive cultivars differ in the size and color of their fruit, in oil content, as well as in quality. Some cultivars produce oil superior to that of most others. Thus, olives vary from cultivar to cultivar, as do apples or other fruits.

Unlike other fruit-producing trees, however, olive trees live to be centuries old and sometimes thousands of years old. The aged trunks in the natural environment of an olive grove are eye-catching; they make people appreciate Nature’s work of art and lead to the trees’ conservation and their characterization as areas of “particular natural beauty” for some (Simantirakis & Lykoudi, 2001), or as “Monumental Olive Trees of the World” for others (Association of Cretan Olive Municipalities [ACOM], 2002) (Figure 1.1).

There are several monumental trees in many countries (Italy, Spain, Portugal, Cyprus, Greece, etc.). In Greece, for example, there are the olive trees of the goddess Athena, of Plato, and of Hippocrates. There is also the olive tree of Kalamata (Psyllakis *et al.*, 2003) with an 8-meter perimeter; it is more than 800 years old and is the only tree that survived the big fire (1821–1824) in Peloponnese. On the island of Crete, among the 20 ancient olive trees that are older than 1000 years, the famous “olive tree of Vouves” is probably one of the oldest olive trees in the world, still producing some fruit, with an age estimated between 2000 and 3000 years old. This natural monument attracts many visitors every year.



Figure 1.1 Monumental olive trees. Left: Mother tree of Kalamata olives. Center: Tragic physiognomy – trapped spirit of the wood. Source: Courtesy of Simantirakis. Right: Ancient olive tree of the editor’s area. Source: Courtesy of Mountakis.

1.3 Evolution of the olive tree from a botanical point of view

The olive tree (*Olea europaea* L.) is the most distinctive tree of the Mediterranean flora, and it can be found in all of the surrounding Mediterranean Sea countries. Native olive trees can also be found beyond the Mediterranean countries, such as in Portugal to the west and in Jordan, Iraq, Iran, and up to Turkmenistan to the east.

During the evolutionary course of the olive tree, more than 1500 olive cultivars were created by man, making its expansion possible not only throughout the Mediterranean basin and the Middle East, but also even further to the Americas, Oceania, Central and Southern Africa, East Asia, and Southeast Asia.

Worldwide, the cultivation of the olive tree occupies more than 9,800,000 hectares and it is the sixth most important crop for production of edible oils. Only 15% of the olive groves throughout the world are irrigated. Furthermore, about 20% of all the olive groves are considered as “marginal” because they occupy areas of low productivity, that is, areas that are not suited for other, more demanding fruit trees. Another 50% of the olive groves can be characterized as “traditional,” and only 30% of the groves are “modern” – with young trees of an intensive form and satisfactory cultivation, which give 50% of the total olive products (Lombardo, 2007).

Regarding the cultivated land areas, Spain comes first in the world with approximately 2,572,500 hectares, followed by Tunisia with 1,780,000 hectares, Italy with 1,212,000, Greece with 900,000, Turkey with 778,000, Morocco with 735,000, and others. In recent decades, olive tree cultivation has spread to many countries. The successful mechanization of its cultivation, mostly in the form of hyper-intense linear olive groves, has found new grounds, potentials, and capability for a rapid expansion of olive cultivation in countries possessing large tracts of land but a limited or costly workforce.

1.3.1 Botanical classification

The olive tree *Olea europaea* L. belongs to the *Oleaceae* family. There are other known genera of decorative plants that belong to the same family group, such as: *Phillyrea*, *Osmanthus*, *Jasminum*, *Ligustrum* (privet), *Fraxinus* (ash), *Forsythia* (golden bell), and others.

According to a more recent classification, the olive tree (*Olea europaea* L.) is placed in the subfamily *Oleideae* and the genus *Olea*, which includes three subgenera: *Olea*, *Tetrapilus*, and *Paniculatae*. Subgenus *Olea* is divided into two sections: *Olea* and *Ligustroides*. The *Olea* genus includes 33 species totally. Nine of them belong to *Olea* subgenus (one in the *Olea* section, and eight in the *Ligustroides* section), one to the *Paniculatae* subgenus, and 23 to the *Tetrapilus* subgenus (Besnard *et al.*, 2009).

The *O. europaea* species has six subspecies:

1. *O. europaea* subspecies *cuspidata*, deriving from southern and eastern Africa and having spread from the Middle East to China
2. *O. europaea* subsp. *laperrinei*, deriving from central-southern Sahara and the eastern Sahel
3. *O. europaea* subsp. *maroccana*, coming from southwest Morocco, west of Mount Atlas
4. *O. europaea* subsp. *cerasiformis*, coming from the Canary and Madeira Islands, and Porto Santo
5. *O. europaea* subsp. *guanchica*, deriving from the Canary Islands
6. *O. europaea* subsp. *europaea*.

The *O. europaea* subsp. *europaea* subgenus is subdivided into two cultivars: *O. europaea* subsp. *europaea* var. *sylvestris*, which is the wild olive tree, and *O. europaea* subsp. *europaea* var. *europaea*, which is the cultivated one.

In order to make the distinction between the wild and the cultivated olive trees, we could define the wild olive tree, from a botanical point of view, as the subspecies or cultivar of olive tree that would never bear not even one descendant by self-fertilization that could produce large fruit or fruit of high oil content. Based on this definition, two kinds of olive trees can be regarded as wild.

1. The “genuine wild olive trees,” in a botanical sense of the term, located in isolated areas away from the presence of man and other cultivated olive trees.

4 Olives and Olive Oil as Functional Foods

2. The “forest olive trees,” that is, natural seedlings that can be found near other cultivated olive trees. These seedlings, which are usually found on mountains at altitudes from 700 to 1000 m, derive directly or indirectly from seeds of domesticated olive trees or from seeds that have directly or indirectly received the pollen of cultivated olive trees. In a real sense, these kinds of olive trees are nothing but tamed olive trees in a natural form, and under no circumstance should they be considered as “genuine wild olive trees.”

The small leaves and dense leaf order, two characteristics often found on the “forest olive trees,” should not be related to the features of the “genuine wild olive trees” because they are standard characteristics of every young olive tree and gradually fade when they start bearing. Apart from young seedlings, olive trees that derive from tissue culture may also have characteristics of temporary youthfulness.

The longer the olive tree is cultivated in an area, the harder it is to find genuine wild olive trees in that area, due to the ever-increasing presence and scattering of pollen from cultivated olive trees. On the contrary, the further back we go timewise, the higher the chances are of meeting them, mainly in the form of grafted subjects on perennial olive trees. This happened because, back then, in the majority of cases, the number of cultivated olive trees was much smaller and, therefore, so was the spreading of pollen from tamed olive trees in comparison with the number of wild olive trees and their pollen.

1.3.2 Origin and revolution of the olive tree

There have been several views presented by many researchers about the origin of the olive tree, such as the eastern Mediterranean Basin, Anatolia (southern Asia Minor), Syria, and central Mesopotamia. According to still other theories, there have been other places regarded as being the birthplace of the olive tree; these are further east of Asia Minor as far as the west shores of the Caspian Sea, south Caucasus, Sudan, Ethiopia, and others (Breton *et al.*, 2012).

Many of these claims are based on the existence of a large number of native wild olive trees in Anatolia (Pelletier), in Asia Minor (De Candolle), and in Syria, as well as on the existence of the species *Olea cuspidata* in Iran, which some assume has contributed toward the evolution of the cultivated olive tree. Other theories also claim that the cultivated olive tree probably derives, via the wild olive tree, from *Olea chrysophylla* Laxx (Blázquez, 1996). Using modern molecular methods, it has been proven that the tamed olive tree is a descendant of the wild olive tree (Breton *et al.*, 2012).

One of the most prevalent theories suggests that the cultivated olive tree was tamed and evolved approximately 6000–7000 years ago, between 4800 and 4300 BC (Zohary *et al.*, 2012), in the eastern Mediterranean Basin. It then moved on and spread initially in the Aegean (Cyclades, Crete, and mainland Greece), later on in the central and western Mediterranean, and from there it spread to the Americas, Oceania, southern Africa, and other places. However, for many researchers, the fact that genetic differences between domesticated and wild olive trees were found by using molecular markers in the western Mediterranean Basin is not sufficient evidence regarding the origin of the olive tree from the eastern part of the Mediterranean (Breton *et al.*, 2012). Thus, the places of origin and taming of the olive tree, in general, remain unknown, and many scientific groups in several countries are involved with the research in this field.

Many Mediterranean populations, however, played an important role in spreading the cultivation of the olive tree, such as the Hittites in Syria and Anatolia, the Jews, the Phoenicians, the Egyptians, the Hellenes, the Romans, and others. Signs excavated in Ebla, a district of northern Syria near Aleppo, dating back to the third millennium BC, prove extensive production of olive oil there (Blázquez, 1996). Ebla at that time ranked third in olive tree cultivation, and according to the existing records there were three olive groves in that area, two of them with 500 olive trees each and one with 1000 trees (Rodríguez, 1996). From the second half of the second millennium BC, more data are available regarding the olive oil of Syria. During the Late Bronze Age, in the Ugarit area of Syria (today called Ras Shamra), the production of olive oil was about 5000 tons. Exports of olive oil from that area were made to Cyprus, Asia Minor, and Egypt (Hadjisavvas, 2008). Despite the fact that there are no explicit reports in the Egyptian records, Egypt was the major destination of the olive oil produced on the Syrian-Palestinian coast (Hadjisavvas, 2008).

Evidence proves the spreading of olive tree cultivation in the Near East (Levant) since the Chalcolithic era (3700–3500 BC) (Kelder, 2009); however, the date of first cultivation of the olive tree in southern Mesopotamia seems to be unknown. In Egypt, olive oil is mentioned for the first time during Dynasty XVIII

(1570–1345 BC). Later, during the reign of Ramses II (1197–1165 BC), olive tree cultivation was practiced in Egypt; and, according to an inscription found in the temple of the god Ra in Heliopolis, the olive trees around the city produced the best-quality olive oil, used for the lighting of the palace. These olive trees, which were cultivated in the Nile Valley, are believed to have derived or originated from Syria (Blázquez, 1996), with whom the Egyptians traded.

During the era of Pharaohs Tuthmosis III and Akhenaten, and maybe even later during the era of Ramses II, there was important documented diplomacy and commerce between Egypt and Mycenae. During that period, there were at least three diplomatic delegations between Mycenaean and Egyptians (Kelder, 2009) where olives and olive oil from Argolis were offered to the pharaohs.

On a sculptured stone discovered in the temple of the god Aten in Amarna, the new capital founded by Akhenaten the Reformer, the pharaoh is presented holding an olive tree branch with olives (Hadjisavvas, 2008). Additionally, a mural was discovered in Amarna depicting an olive tree and an olive leaf wreath (Kelder, 2009). Judging by the size and the shape of the leaves of the tree in the mural, it seems that the depicted olive tree is tamed and not derived from a seed. This fact confirms the existence of cultivated olive trees during that time.

The existence of diplomatic relations between the Mycenaean and the Egyptians along with the appearance of the olive tree in Egypt not only show the pharaohs' interest in the olive tree and its oil, but also provide evidence of the direct or indirect involvement of the Mycenaean in introducing cultivation of the olive tree on the banks of Nile. Therefore, it seems that even if the Mycenaean did not directly offer young olive trees to the Egyptians, they at least helped them with their attempts to cultivate the trees (Kelder, 2009).

The presence of the olive tree in northern Africa dates back to the 12th millennium BC (Camps-Fabrer, 1996), but according to Pliny its cultivation was unknown in that part of the world until the sixth century BC. The same thing is confirmed by Diodorus of Sicily about the late fifth century BC, saying that at that time oil was imported in northern Africa from the Greek city of Akragantas and that, by the end of the fourth century BC, northern Africa was full of olive groves (Blázquez, 1996).

The Roman contribution to the expansion of olive tree cultivation to northern Africa was very determining. They made olive tree spreading easier by applying two very important arboricultural techniques: grafting, which made the wild olive trees productive, and transplantation. There is evidence of the presence of the olive tree in the Negev Desert dating back to 4200 BC, and clear indications about olive oil production on Mount Carmel from the sixth millennium BC. Olive tree cultivation in the area of today's Israel is believed to have started much later (around 3500 BC), but it was notably widespread in 1000 BC (Eitam, 1996). This fact is confirmed by archaeological findings at Tel Miqne Ekron, where one of the biggest olive oil processing units was discovered. According to Eitam (1996), there are specific reports about exports of important quantities of olive oil from Canaan to Egypt during the 15th century BC.

Archaeological findings of the olive tree have been found in all Mediterranean countries, with the oldest of them being in the eastern part and dating from the Late Paleolithic era to historical times. More specifically, the most ancient fragments of wild olive kernels, estimated to be approximately 19,000 years old, have been found on Ohalo II, a location near the modern city of Tiberias (Kislev *et al.*, 1992; Sarpaki, 2003).

In the broader Greek area, Aegean and mainland, the existence of the olive tree is confirmed to date back to 50,000 years ago. Some of the oldest Paleolithic findings of olive tree wood of the eastern Mediterranean have been found in Cave Kleisoura, eastern Peloponnese (Carrión *et al.*, 2010). However, the most characteristic findings are the fossilized olive leaves, 35,000 to 50,000 years old, which were discovered in volcanic ash on the Greek islands of Nisyros and Santorini (Thyra) (Figure 1.2).

Cyprus, Crete, and the islands of the Aegean Sea were the first areas in Greece where the olive tree was cultivated. Nevertheless, its intensive cultivation in these areas seems to have begun only toward the end of the Late Bronze Age (1600–1100 BC). At that time, copper and olive oil were possibly the two most important commodities (Hadjisavvas, 2008). Consequently, olives and olive oil were an important source of wealth and power during the Minoan and Mycenaean times. The economies of both civilizations largely depended on the production and trade of olive oil. It would not be an exaggeration if we characterized olive oil as the petroleum (fuel) of that time (Zerefos, 2013). Large depositories of olive oil have been discovered in Knossos, Pylos, and other parts of Crete and Peloponnese, respectively. Greeks at that time considered the quality of olive oil to be of great importance and were the first ones to identify and dissociate the wild from the tamed olive trees and their corresponding oils. The olive oils in the Mycenaean palaces were produced not only from domesticated trees but mostly from wild ones in a ratio of 2:7 (Kelder, 2009).

6 Olives and Olive Oil as Functional Foods



Figure 1.2 Fossilized olive leaf.

1.3.3 Domestication of the olive tree

In order to define the process of domestication and the origin of a cultivated olive tree, it would be useful first to designate some possible stages of this process. Bearing in mind the stages of domestication of other fruit trees by man, such as the fig, date, palm, and so on, we may suppose that the stages of domestication of the olive tree could be similar.

It is possible that the utilization of the wild and tamed olive tree began in the eastern Mediterranean very early, with its wood being used as fuel and construction material, and its leaves as animal feed. Additionally, the utilization of olive trees might have been generalized around 6000 BC with the development of olive oil production techniques from wild olive trees for medicinal and cosmetic use or as lamp fuel. Nevertheless, at that time the fruit could not be consumed in its natural form (Hadjisavvas, 2008).

It is possible that the reason for the first stage of human domestication of fruitful trees is that people had as a principal criterion the direct consumption of the ripe fruit straight from the trees – that is, consumption without any processing. If this is the case, the same criterion was true for the olive trees as well. Selection of olive trees based on the oil content of their fruit probably came later. Even much later, people probably thought of looking for ways of processing bitter olive fruit and producing olive oil from “tamed” olive trees.

1.4 A different approach

The theory of olive tree domestication, based on the fact that the starting point was the ability of some trees to produce edible fruit that needed no processing, can be supported not only by archaeological findings but also from the fact that a pre-Minoan multi-trunk olive tree was discovered on the island of Naxos, Greece. This tree is possibly the oldest olive tree in the world (Figure 1.3). It consists of several trunks covering a much larger trunk whose diameter is over 10 meters (Kostelenos, 2011, 2015). The age of this tree, judging by its diameter (ACOM, 2002), is estimated to be 4500–5000 years, and it belongs to the cultivar Throumbolia Aegaiou (Kostelenos, 2011, 2015), along with many other olive trees of different ages existing in the same location.

‘Throumbolia Aegaiou’ is a Greek olive tree cultivar found even nowadays in all of central and southern insular Greece, Attica, Euboea, Lesbos, Chios, Samos, the Dodecanese, Cythera, and Crete. It is the only known cultivar that under normal field conditions produces fruit that can be consumed in its natural form straight from the tree without any processing (Anagnostopoulos, 1930). The fruit of this particular cultivar is collected and marketed even today in Greece and is known to consumers under the name of Thrumbes.

We don’t know if the domestication of the olive tree happened in only 10 different locations (Breton *et al.*, 2012), or if it happened in many places and not only in the Near East (Newton *et al.*, 2014) or only in the Near East and eastern Mediterranean during the Chalcolithic era around 4000 BC (Zohary & Spiegel-Roy, 1975),



Figure 1.3 The pre-Minoan multi-trunk olive tree.

or even between 3300 and 3100 BC (Kislev, 1995). What we know, however, is that the existence of the Naxos olive tree coincides with the starting point of global olive growing. This fact proves the continuous cultivation of domesticated olive tree cultivars in Greece since pre-Minoan times up to this day, and it supports the hypothesis of the domestication and origin of the cultivated olive tree in the eastern Mediterranean.

Furthermore, the Naxos olive tree, along with all other trees of the same cultivar but different ages existing in the same area, strengthens the base of the theory of Anagnostopoulos (1951), which is that the cultivated-domesticated olive tree derives from Crete or that the olive tree was domesticated in the broader Aegean area. Patac *et al.* (1954) also agrees with this theory, whereas Camps-Fabrer (1953) seems to be reserved about it. Anagnostopoulos (1951) talked about another ancient olive tree that existed on Iera Odos Street in Athens; it was known as “Plato’s olive tree” and was in its half part ‘Throumbolia Aegaiou’, which is the same cultivar as that of the Naxos olive tree. It should be noted that Attica is the western boundary of this cultivar in the Greek area (Kostelenos, 2011, 2015).

Apart from the paleobotanical and archaeological evidence, the existence of a large number of perennial domesticated olive trees in the Aegean, Crete, and mainland Greece supports the opinion that the center of domestication of the olive tree is the Aegean and that the Hellenes (Greeks) were involved in its evolution. Additionally, ancient Greek literature in the form of myths managed to salvage and has available information on the geographical expansion of the olive tree 4000–6000 years ago, and also on the area of its domestication. Subsequently, two well-known myths will be explored. The first deals with wild olive trees, whereas the second is about tamed ones:

1. Pindaros in *Olympia Γ’ (Olympian 3)* mentions that Hercules, when he returned to Greece from the shady banks of Istria (Danube), brought a wild olive tree with him and planted it in Olympia. This indicates two things: first, the initial contact of the Greeks with olive trees was with wild ones and not tamed ones; and, second, in earlier periods when the climate was warmer, such as the Minoan warm period (Grootes *et al.*, 1993), the cultivation of wild olive trees extended as far north as the banks of the Danube River (i.e., farther north than it is today). This first contact with the wild olive trees, as well as their presence so far north and away from the warm Aegean Sea, was something impressive for the ancient Greeks, remaining etched in their “collective memory” and expressed through the myth of Hercules. Branches from this very first wild olive tree, planted in Olympia, were used to make the olive wreaths given to winners of the Olympic games. During the Roman times, there was a temple with a statue in honor of “Hercules olivarius” on the island of Delos (Blázquez, 1996).
2. A second myth regarding the origin of olive trees is that of the dispute between the god Poseidon and goddess Athena, about which of the two should give their name to the newly founded city of Kekrops (Athens). The myth says that the council of gods gave the victory to Athena because she offered the first

8 Olives and Olive Oil as Functional Foods

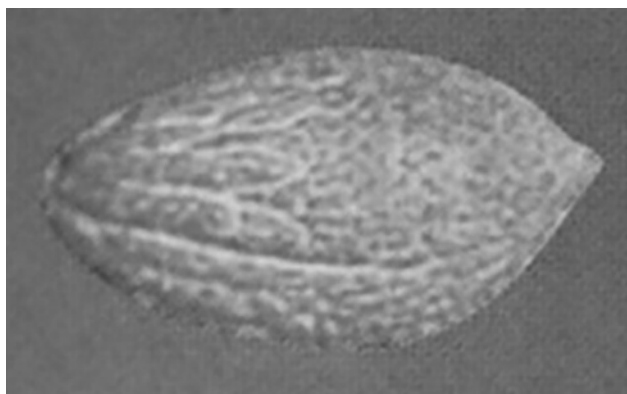


Figure 1.4 Modern Throumbolia Aegaiou kernel.

“domesticated-cultivated olive tree” as a gift to the city. According to tradition, this tree was planted on the Acropolis, at Erechtheion Temple, and the city was named after Athena. In another interpretation of the myth, the council of gods – that is, the entirety of natural laws (ecology, climate, and natural and economic conditions) – gave the victory to Athena, who symbolizes human intelligence (Anagnostopoulos, 1951). Possibly with this myth, two other facts are testified: first, that domestication of the olive tree happened in Greece; and, second, that it was carried out by the Greeks.

Although the myth of the dispute between Poseidon and Athena could be considered as an unsubstantiated exaggeration in order to document Greece as the place of origin of the domesticated olive tree, we should not overlook the fact that other Greek myths that were considered exaggerations up to 150–200 years ago, such as Homer’s reports on Troy and Mycenae, were proved real when these cities came to light after archaeological excavations. In nowhere else in the Mediterranean, or any other place where the olive tree has been cultivated for the past 4500–5000 years, can one find kernels (Figure 1.4) that have the same macroscopic characteristics as the kernels found in the seventh-century BC excavations in Andros (Megaloudi, 2006) (Figure 1.5) and the Minoan III excavations in Crete, as presented by the archaeologist Chatzi-Vallianou (2003) (Figure 1.6).

We must note at this point that Minoans were the first people in the Mediterranean who could clearly tell apart the difference between the wild and the domesticated olive trees and their respective oils 3500 to



Figure 1.5 Olive kernel found in Andros.

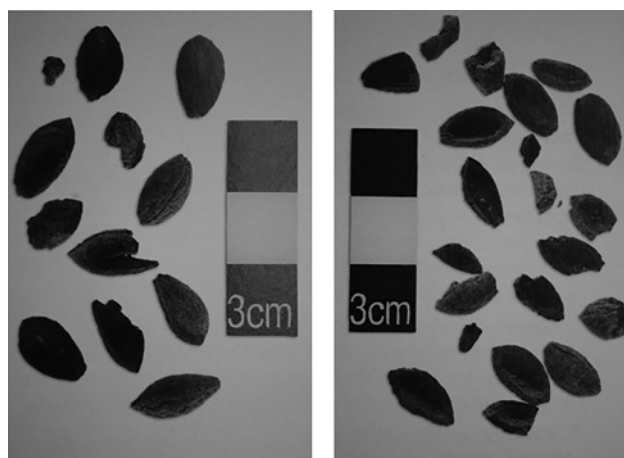


Figure 1.6 Protopalatial kernels (left) and Late Minoan III ones (right) in Crete.

4000 years ago (Vasilakis, 2003). To sum up, after carefully observing and then comparing the carbonized olive kernels found in the vicinity of Teleilat Ghassul, one may easily notice a heterogeneity in both shape and size. After doing the same with the olive kernels from Minoan Crete, however, a homogeneity in shape and size will be detected (Chatzi-Vallianou, 2003). This fact clearly suggests that the Teleilat Ghassul kernels belonged to heterogeneous plant material, possibly wild olive trees, whereas those from Minoan Crete belonged to a homogeneous plant, meaning cultivated olive trees.

It is possible that olive oils could be found throughout the eastern side of the Mediterranean, but they were produced from wild olive trees. Only in Minoan Crete, in the islands of the Aegean Sea, and in the Mycenaean mainland does it appear that domesticated olive trees produced edible fruit (Vasilakis, 2003) and, furthermore, tamed “sweet” olive oils not produced in other parts of the Mediterranean. This is possibly the most important reason why the Minoan and Mycenaean olives, edible olive oils, and cosmetic olive oils were in great demand in Egypt and elsewhere.

With the gradual expansion and increase in the number of domesticated olive trees, first in the eastern Mediterranean, then throughout the Mediterranean, and eventually in the rest of the world, the olive oils from wild olive trees were progressively replaced with oils from domesticated olive tree cultivars. Nowadays, however, some people are interested again in olive oils from wild olive fruit because of their high composition in phenolic compounds, and these are sold at much higher prices. The hypothesis of the olive tree’s domestication in Greece is supported by the large number of cultivars mentioned in the ancient Greek literature, as well as the great variability among them. Tavanti (1819) reports five Jewish, three Egyptian, and 15 ancient Greek names of olive cultivars based on reports of the ancient Greek, Latin, and Jewish literature. Besides this, Lychnos (1948) refers to 16 ancient Greek olive tree cultivars (Table 1.1).

We must take into consideration the fact that in Greece as well as in other olive-growing countries, only less than half of the existing cultivars were recorded up to 100 years ago. As a result, the number of olive tree cultivars mentioned in the ancient Greek literature must have been only a small fraction of those that really existed, and proportionally the domesticated olive tree cultivars must have numbered at least 30.

Greece and the broader Aegean area have always been rich in olive tree cultivars and constitute a large “reservoir” of olive cultivars that has supplied many other parts of the Mediterranean in the past. Ramon Blanco (1927) reports that ‘Arbequina’, a Spanish olive tree cultivar, was introduced to Spain from Greece along with other olive cultivars by Duke Medinaceli, a Spaniard, around 500 years ago. Moreover, Rados Antonio Michieli Vitturi (Michieli Vitturi, 1788), while referring to the introduction and cultivation of the olive tree in Dalmatia, mentions that among the olive cultivars found in that area, several had been introduced from the “islands of the Archipelagos,” that is, the islands of the Aegean Sea.

The broader Greek area and the Aegean Sea have not stopped producing up to this day new “original” olive cultivars. A characteristic example is the white fruit ‘Asprolia Alexandroupolis’ (*aspro* in Greek means

10 Olives and Olive Oil as Functional Foods

Table 1.1 The ancient Greek olive tree cultivars.

	Cultivar	Comments
1	'Kallistefanos'	The wild olive tree cultivar that existed in ancient Olympia and was used for making the wreaths for the Olympic Games
2	'Kotinos' or 'Fylia'	The wild olive tree that was also called Elaios, Agrifos, Agrippos, Agrielaios, Rahos Streptos, or Eiresioni
3	'Favlia' or 'Favlios'	A cultivar whose fruit turned white during ripeness
4	'Ehinos'	A cultivar whose leaves had a large curved thorn on the top
5	'Stemfylitis'	A cultivar whose olives were smashed and kept in brine
6	'Moria'	The first tamed olive tree cultivar found within the inner sanctum of the Acropolis temple
7	'Dryepis' or 'Ryssi'	A cultivar whose olives ripened on the trees or resembled acorns
8	'Rafanis'	A cultivar whose fruit looked like radish
9	'Nitris'	A cultivar whose olives were processed with salt
10	'Kolymvas', 'Niktris', or 'Vomvia'	Its olives were preserved fully in brine or olive oil
11	'Almas' or 'Hypoparthenos'	A cultivar whose fruit was prepared salted or preserved in brine
12	'Orhas' or 'Orhemon'	Olives in the shape of testicles
13	'Gergerimos' or 'Ishas'	The olives of this cultivar were left to drop from the trees.
14	'Goggylis'	A large fruited cultivar, similar to Almada, whose olives resembled dates
15	'Trampellos'	–
16	'Ishas'	Its olives resembled kidneys.

“white”), a cultivar from Thrace, Greece (Kostelenos, 2003), which is the only known white fruit cultivar in the world capable of producing large and potentially marketable olives (Figure 1.7). It has changed from what could be considered as a small fruited “wild” tree to a domesticated large fruited tree with olives that can no longer be considered wild, due to their size.

1.5 Conclusion

Eastern mainland Greece, and above all the Aegean Islands and Crete, could be considered at least as the primordial place of domestication and evolution of the olive tree and the development of olive growing as well. From this region, the cultivated olive tree spread throughout the Mediterranean and from there on to



Figure 1.7 Olive from the Asprolia Alexandroupolis cultivar.

the rest of the world. This is probably the reason why the olive tree is regarded as the tree of the Greeks (Bartolini & Petrucelli, 2002).

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12 Olives and Olive Oil as Functional Foods

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