

The Ethnobotanical Evolution of the Mediterranean Cypress (*Cupressus sempervirens*)

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Abstract: The Mediterranean cypress (*Cupressus sempervirens*) is an evergreen conifer that belongs to the Cupressaceae, which is the first plant family whose detailed evolutionary history traces the break-up of the supercontinent Pangaea roughly 150 million years ago. The broad and deep economic and socio-cultural significance of the species began in at least the third millennium BCE. This interdisciplinary review highlights the tree's exemplary uses and meanings, starting in ancient Elam, Sumer, Egypt, and Persia, and continuing to the Graeco-Roman world, Islamic Empires, and Western Europe. The Mediterranean cypress has been used as timber for buildings, coffins, furniture, and statuary; in religious and spiritual symbolism; as ornamentals in gardens and cemeteries; in aromatic anointments and medicine; as literary metaphors; and as motifs in decorative and fine art. Many of the artifacts, artworks, and literature known to be influenced by the cypress are iconic: the Gudea cylinders, the outer coffin of Pharaoh Tutankhamun, the poetry of Virgil and Ferdowsi, Istanbul's Topkapi Palace, Shakespeare's plays, and the paintings of Vélasquez and Van Gogh. Knowledge gaps in the scholarly literature on the species are identified, which require additional research in a variety of fields. For example, the number of varieties within the species remains inconclusive. Identifying the precise timing and geographic location of the tree's influence on human civilization is hampered by methodological challenges. Studies of other plant species might benefit from the holistic approach taken in this review.

Key Words: Mediterranean cypress, Archaeobotany, Ethnobotany, Garden history, Art history

Introduction

Cupressus sempervirens L. is a member of the family Cupressaceae, the subfamily Cupressoideae, and the genus *Cupressus*. The first botanical family whose detailed evolutionary history traces the break-up of Pangaea (Ludwig-Maximilians-Universität München 2012),

Cupressaceae is thought to have originated over 200 million years ago in the Triassic period of the Mesozoic era, when earth's supercontinent was still intact. As Pangaea gradually separated into two parts roughly 150 million years ago, members of the subfamily Cupressoideae ended up mainly on the northern continent, Laurasia, which contained what would become North

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America, Greenland, Europe, and much of Asia (Mao et al. 2012). The taxonomy of the *Cupressus* genus is fluid, as techniques such as DNA analysis reveal different relationships among species (Little 2006; Terry et al. 2016). Other species currently placed within *Cupressus* include the Tibetan cypress (*Cupressus gigantea* W.C. Cheng & L.K. Fu), Bhutan cypress (*Cupressus cashmeriana* Royle ex Carrière), and Saharan cypress (*Cupressus dupreziana* A. Camus) (Sekiewicz et al. 2018). Genetic analysis indicates that the lineage specific to *C. sempervirens* originated in the Pliocene epoch some 5.3 to 2.6 million years ago (Bagnoli et al. 2020). The species has been introduced to so many geographic areas that it is difficult to conclusively identify its native range. However, this range is generally believed to span the Eastern Mediterranean: Crete, Cyprus, the eastern Aegean Islands, south-western Turkey, Lebanon, Syria, Israel, Jordan, probably north-eastern Libya, and locations in northern and southern Iran (Sekiewicz et al. 2018). The cypress tree now grows in four dozen countries and on every continent except Antarctica, favoring areas with Mediterranean-like climates (CABI Compendium 2022).

Cupressus sempervirens grows in two major forms: a spreading, horizontal form, and the more familiar columnar or fastigiata shape. While some taxonomists argue that these are both botanical varieties that predate human activity, others believe the fastigiata form is a cultivar by result of intentional breeding for certain characteristics (Caudullo and de Rigo 2016). Taxonomists in Iran have reported three *C. sempervirens* varieties based on crown type (Farahmand 2019).

Common names for *Cupressus sempervirens* include Mediterranean cypress and Italian cypress. As with many plant species, using common names in the absence of binomial nomenclature leads to ambiguity. While the species that

are listed in Table 1 are often called cypress, not one is botanically considered to be a true cypress. The first three are in the conifer family Cupressaceae, but are organized into different subfamilies than *C. sempervirens*. The Japanese cypress—*Chamaecyparis obtusa* Siebold & Zucc.—shares the same subfamily with *C. sempervirens*, but it is within a different genus.

Table 2 summarizes how the major botanical characteristics of *Cupressus sempervirens* are related to the specie's long and rich economic and sociocultural influence on human civilization. Although wood remains of the species believed to be associated with the late Pleistocene Natufian culture, (c. 12,800 to 10,500 BCE) were excavated in Israel (Lev-Yadun and Weinstein-Evron 1994), available evidence for specific uses and meanings of the cypress tree is associated with cultures that emerged several millennia later, beginning with Elam, Sumer, and Egypt; and continuing with the Persian Achaemenid, Parthian, and Sasanian Empires; the Graeco-Roman World; the Arab Dynasties and Islamic Empires; seventeenth century Europe; and twentieth century Western Europe.

Studying the uses and meanings of plants warrants a critical approach, especially in regard to ancient eras. The Mediterranean cypress is no exception. Evidence is sometimes ambiguous or inconsistent. Analytical techniques are at present not able to distinguish pollen evidence among species within the family Cupressaceae. Positive identification of visual images of cypress trees can be tenuous due to their similarity to the conifers that may have grown in the same locations in ancient times. Contextual information from ancient periods—such as written texts/inscriptions or other cultural practices—that would increase confidence in identification of a species, as well as its use and meaning, is often unavailable or speculative. Even written texts or inscriptions are subject to differing linguistic

TABLE 1. EXAMPLES OF SPECIES COMMONLY CALLED CYPRESS, WHICH ARE NOT TRUE CYPRESS.

Common name	Botanical classification	Contrast with <i>C. sempervirens</i>
Patagonian cypress	<i>Fitzroya cupressoides</i> (Molina) I. M. Johnst	Different subfamily (Callitroideae)
African cypress	<i>Widdringtonia wallichii</i> Endl. ex Carrière	Different subfamily (Callitroideae)
Bald cypress	<i>Taxodium distichum</i> (L.) Rich	Different subfamily (Taxodioideae)
Japanese cypress, Hinoki cypress	<i>Chamaecyparis obtusa</i> Siebold & Zucc	Same subfamily (Cupressoideae), but different genus

TABLE 2. SUMMARY OF BOTANICAL CHARACTERISTICS AND USES/MEANINGS OF *C. SEMPERVIRENS*.

Botanical characteristics*	Uses/meanings	Cultural origins of uses/meanings
Evergreen, with a lifespan that can reach 600 to a few thousand years	Religious and spiritual symbolism	Possibly Egyptian; Persian; Graeco-Roman; Islamic
Durable and decay-resistant wood	Timber for use in construction, coffins, furniture, and artifacts	Sumerian; Egyptian; Persian; Graeco-Roman
Height (25–40 m tall)	Ornamentals and windbreaks	Possibly Elamite; Sumerian; Egyptian; Persian; Graeco-Roman; Islamic; Western European
Grows in two major forms: (i) a spreading, horizontal form and (ii) a more familiar, columnar, and flame-like shape, which is termed as “fastigiata”	Literary metaphor Motif in decorative and fine arts	
Dark colored, scale-like foliage	Symbol of death, funerals, and mourning	Graeco-Roman
Gymnosperm, which bear no flowers or fruit	Symbol of simplicity, lack of substance, freedom	Islamic
Chemical content including polyphenols, terpenes and essential oils, especially in leaves and cones	Use in medicine and aromatic anointments	Sumerian; Egyptian, Graeco-Roman

*Sources: American Conifer Society 2022; Caudullo and De Rigo 2016; Earle 2022; Orhan and Tumen 2015

interpretations: the same common name for a plant may refer to a different species, or to a group of species that are all conifers. With this critical perspective in mind, the goals of this review are to highlight examples of how the botanical characteristics of the Mediterranean cypress tree are intertwined with its influence in each of the cultural spheres and to integrate the patterns of use and meaning of the cypress tree across these cultures over time. Future research in various fields is also detailed, which address key knowledge gaps related to the species.

Uses and Meanings of the Mediterranean Cypress Across Time and Cultures

MEDITERRANEAN CYPRESS IN ELAM AND SUMER

The cylinder seal in Fig. 1, dated from 3100 to 2900 BCE, was excavated from the ancient city of Susa, a capital of Elam, now the western Iranian province of Ilam. It is possibly the oldest attestation of *Cupressus sempervirens*. Influenced for thousands of years by southern Mesopotamia on the west and tribal Iran on the north and east, by the third millennium BCE,

Elam had become “the first cultural and political entity recorded in the history of Iran” (Harper et al. 1993, p. 316). Cylinder seals were used to record commodity transactions with a nascent writing system that was inspired by the proto-cuneiform used at the time in southern Mesopotamia. The image on the seal depicts a plant placed on top of a mountain. Identification of the tree species varies: Legrain (1921) considered it to be a cypress tree; Delaporte (1920) a generic conifer; Alvarez-Mon (2020) a conifer or cypress species; and Amiet (1980) as leafage meant to convey a large but unidentifiable tree species. Elam is located on the western border of modern-day Iran, roughly halfway between the north and south of the country. The native origins of *C. sempervirens* in Iran are associated with the Elburz Mountains in northern Iran and three island locations in southern Iran (Seki-ewicz et al. 2018). However, Farahmand (2019) noted an extant natural stand of cypresses in Ban Sarv in Zagros, in Ilam Province, that may be 3,000 years old. Whether or not this stand existed centuries earlier during the Elamite area—and thus may have influenced the crafting of the cylinder seal image—is not yet known.

The next oldest attestation of the Mediterranean cypress is from the economic and cultural center of Sumer. The Mesopotamian Sumerian civilization emerged in roughly



Fig. 1. Cylinder seal with caprids, heulandite, c. 3100–2900 BCE. Musée du Louvre, Paris, France. RMN-Grand Palais/Art Resource NY <https://collections.louvre.fr/ark:/53355/cl010176715>.

4500 BCE and was eventually followed by the Akkadians, Assyrians, and Babylonians. These cultures thrived until the rise of the First Persian Empire, the Achaemenid, in the sixth century BCE.

The wood of the cypress tree can likely be found in written cuneiform lists of Sumerian construction inventories as early as 2500 BCE (Tinney and Jones 2022). However, the first literary mention of cypress trees known to date is on the Gudea cylinders from c. 2100 BCE. Unearthed in 1877 during excavations in the city-state of Lagash, Iraq, the cuneiform script on these clay cylinders reflects the longest known text written in the Sumerian language. They describe a mythical account of the building of Ninĝirsu’s temple, which is thought to be authored by Gudea, a ruler of the state of Lagash in Southern Mesopotamia. He commissioned the building of the temple.

The narrative on the cylinders that refers to cypresses indicates that in early Sumerian literature, the tree was valued for its use as building material—a function of its durable and decay-resistant wood—and also as an anointment (Table 3). The wood’s anti-microbial and insecticidal properties are likely a function of essential oils which include, among other compounds, alpha-cedrol, and carvacrol methyl ether (National Institute of Health 2022; Ucar et al. 2019). Essential oils are also present in the leaves, branches, and cones of the cypress tree. In modern times, extracts have been used in products related to cosmetics and aromatherapy (Hussain et al. 2019). Iraq is not included in the native range of *Cupressus sempervirens*. Reference in the myth to bringing cypress trees to Lagash from the “uplands,” may refer to the Zagros Mountains, which are along the border of modern Iraq and Iran. Alternatively, wood from cypress as well as

TABLE 3. THE BUILDING OF NINĜIRSU’S TEMPLE: TEXT FROM GUDEA, CYLINDERS A AND B (BLACK ET AL. 2006).

“I will bring ḫalub and neḫan trees up from the south, and cedar, cypress and zabalum together will be brought for you from the uplands.”
“It was like a giant serpent floating on the water as, for Lord Ninĝirsu, Gudea had the long rafts floating downstream moor at the main quay of Kan-sura: logs of cedar wood from the cedar hills, logs of cypress wood from the cypress hills, logs of zabalum wood from the zabalum hills, tall spruce trees, plane trees, and eranum trees
“He shook the brick mold and left the brick to dry. He looked at the...with satisfaction. He anointed it with cypress essence and balsam (?)”
“As they placed wooden beams on the house, they looked like dragons of the abzu coming out all together ... Its upper parts were covered with luxuriant cedar and cypress, and they put white cedars in its inner room of cedar, marvellous to behold.”

cedar (*Cedrus libani* A. Rich.) could have been brought from the mountains of Lebanon, northern Syria, or Turkey (Streck 2017).

Although the context and meaning of the tree are less clear than in the Gudea cylinders, cypresses are also mentioned briefly in the Standard Babylonian version of the well-known ancient poem, the *Epic of Gilgamesh*, dated from 1000 to 1300 BCE (George 1999). The latter is written in Akkadian (also Babylonian) language, which is an adaptation of Sumerian cuneiform. The term used for cypress was *šurmēnu* (Streck 2017).

MEDITERRANEAN CYPRESS IN ANCIENT EGYPT—ENABLING THE AFTERLIFE

Ancient Egypt was centered in the Nile Valley, to the west and south of Mesopotamia. Mediterranean cypress was not native to Egypt (Tutin et al. 1993), so it would have been imported as felled logs or as germplasm for use in planting trees (Bikai 2001; Silver 1991). Wood remains of cypress have been discovered at a burial in the predynastic to early dynastic (c. 6000 to 3100 BCE) cemetery at Hierakonpolis (De Vartavan et al. 2010). Egypt's predynastic phase was followed by a unified dynastic phase, which reached its zenith in the New Kingdom Egyptian Empire (c. 1450 BCE). The Egyptian Empire of the pharaohs slowly diminished and, like Mesopotamia, it was ultimately conquered by the Persian Achaemenid Empire by the sixth century BCE.

Germer (2008) listed several medicinal uses of cypress trees in ancient Egyptian culture, including recipes to treat swelling of the body, joint aches, headaches, burns, and shoulder pain, and as mucilage. Oil derived from Cupressaceae species, likely cypress or juniper (*Juniperus* spp.), was imported by the ancient Egyptians from the Mediterranean Basin for use in mummification (Rageot et al. 2023). The Egyptians were also notable for their use of cypress in coffins, furniture, and artifacts, some of which were associated with tombs. The durability and decay resistance of cypress wood were consonant with preserving the afterlife of the deceased.

Great attention was paid to funeral preparations and rites in ancient Egypt. Tombs provided a home when the deceased entered the world of the afterlife. Decay-resistant Mediterranean cypress wood was incorporated into coffins. The mummy of Pharaoh Tutankhamun was laid to

rest in three nested coffins; wood chips from the outermost coffin have been identified as cypress (Rifai and Hadidi 2010). The coffin of Princess Mayet (c. 1957 BCE), displayed in New York's Brooklyn Museum, was carved from cypress and other wood. It contained one of the royal wives of the founder of Egypt's Middle Kingdom. Cypress wood was also used in Hatneger's chair (c. 1492 to 1473 BCE), which is housed at The Metropolitan Museum of Art in New York. The chair was discovered near the tomb entrance of Lady Hatneger, the mother of an official buried in the Theban Necropolis. Symbols on the chair represented protection of the home, stability, and endurance.

Cypress wood was valued for its durability in various other artifacts, which often had funerary associations (Asensi-Amorós 2016). A jewelry box (c. 1492 to 1473 BCE) crafted from cypress was discovered in the Sheikh Abd el-Qurna District of the Theban Necropolis. A late period cat figurine (c. 664 to 334 BCE), a sacred animal in Egypt, was carved from conifer wood, also likely Mediterranean cypress. A New Kingdom hand-cuff (c. 1500 to 1000 BCE) carved from Mediterranean cypress wood was found in a tomb (Helmbold-Doyé 2019). The shackle may have been added to the grave to serve as protection for the deceased crossing over to the hereafter.

It is possible that Mediterranean cypress trees were among the conifer species included in formal gardens built in proximity to funerary temples. Examples include the funerary temple of the Bent pyramid of King Sneferu (2613 to 2589 BCE) at Dahshur (Alexanian and Arnold 2015; Arnold 2019); and the two funerary temples of Pharaoh Amenhotep III (c. 1391 to 1351 BCE) at Memphis and Thebes (Petrie 1913; Reichart forthcoming; Steindorff and Helck 1957). Reichart (2021) has posited that Mediterranean cypresses, along with acacia (*Vachellia* spp.) and tamarisk trees (*Tamarix* spp.), were possibly planted on the Osiris tomb mound (1550 to 1189 BCE) at the end of the processional route in the city of Abydos. This might in turn link the tree to the concept of immortality. However, additional research is needed to confirm this symbolic association. Identifying *Cupressus sempervirens* in Egyptian art is difficult due to the mixed use of naturalistic, idealistic, and/or hieroglyphic-like forms for flora (Dodson and Ikram 2008; Germer 2008; Reichart 2021). The hieroglyphic term *ash* (𓂏𓂐𓂑; 𓂏𓂐𓂑; 𓂏𓂐)

may be (i) Mediterranean cypress or (ii) more likely an umbrella term used for it along with other coniferous species. Conifers that can easily resemble one another are indeed thought to have grown in ancient Egypt, for example, firs (*Abies* spp.), junipers (*Juniperus* spp.), and pines (*Pinus* spp.) (Asensi-Amorós 2016; Fahmy 2005).

MEDITERRANEAN CYPRESS TREES IN PERSIAN CULTURE—INTERPRETATION OVER MANY CENTURIES

The cypress tree's historical influence on Persian culture is broad and deep, a function of its impressive height, attractive shape, long life-span, and evergreen growth habit. The tree has been valued as a garden ornamental, and as a motif in art, artifacts, and literature. It eventually took on symbolic and spiritual meaning. Today, the cypress remains popular in Persian-style formal gardens in Iran and other countries (Fallahi et al. 2020). The Sarv-e-Abarkuh, an ancient cypress in Yazd Province, remains sacred among Iranians and is the site of rituals related to wish fulfillment and curing of ailments (Farahmand 2019). It is thought to be about 4,000 years old although this age has not been verified (A'lam 2011). Given that the species is native to some parts of Iran, and its cultural centrality, researchers have recently recommended that its common names include the Persian cypress or Zoroastrian cypress (Farahmand and Karimi 2018).

Discerning when and how the uses and meanings of cypress tree emerged in Persia is challenging. Evidence is interpreted inconsistently. The time span of the three ancient Persian Empires lasted for over a millennium—from roughly 560 BCE through the Muslim Conquest in the seventh century CE, except for the period from 330 to 247 BCE when the Greeks ruled the region. Persia controlled a wide swath of territory beyond what is now modern Iran. At its height in 500 BCE, the first Persian Empire (the Achaemenid) was larger than any previous empire in history, encompassing Mesopotamia and Egypt, but also extending beyond the Fertile Crescent; much of this territory was regained during the second Persian Empire (the Parthian) and the third (Sasanian). In these second and third empires, Persia established itself as a cultural center of the ancient world and

as a major trading hub between Europe and Asia. Even after the Muslim Conquest—well over one thousand years after the close of the Achaemenid era—Persian culture endured.

It is in the Persian-influenced Islamic era that the stage may have been set for the socio-cultural significance of the cypress tree from the eleventh century CE to the present. Evidence to date supporting influence of the cypress tree in the first, second, or third Persian Empires is not as compelling. The clearest references to cypress trees in Persian culture are made in the late tenth century CE by the poets Daqiqi (c. 932 to c. 976 CE) and Ferdowsi (940 to 1020 CE).

Even after the Muslim Conquest, the leaders of the Samanid Dynasty (819 to 999 CE) took great interest in Persian culture and commissioned Daqiqi to create an epic that would chronicle its rise. In the poem, he wrote a legendary account of the prophet Zarathustra planting a heaven-sent cypress tree near the city of Kashmar, which became part of a pilgrimage site for Zoroastrians (Dahlen 2016). Before Daqiqi's untimely death in 976 CE, he penned 1000 verses, which Ferdowsi later incorporated into his own 50,000-verse epic poem (Khaleghi-Motlagh 2011). Titled *Shahnameh* (c. 1000 CE), it told the story of the Persian Empire from the creation of the world to the seventh century CE (Davis 2016). Considered to be the national epic poem of Persia the *Shahnameh* is widely credited with reviving Persian culture—its language, history, and legends—centuries after the Muslim Conquest. It remains venerated today.

The early twentieth century historian Abraham Jackson collected data that, while not conclusive, supported the existence of the cypress of Kashmar and its eventual felling in the ninth century CE (Jackson 1928). It is not known whether the legend of the sacred cypress circulated during the Achaemenid, Parthian, or Sasanian Empires. However, the *Shahnameh* etched the cypress tree's prominence into the Persian consciousness. Ferdowsi mentioned cypress trees over 100 times in the poem. In addition to its sacred meaning, Ferdowsi used it to associate characters with tallness, elegance, slenderness, handsomeness, and nobleness. The tree was included in a passage in which the mythical King Feridoun made the world a paradise by planting “the cypress and the rose where the wild herb had sprouted” (Davis 2016, p. n66).

Beyond the work of Daqiqi and Ferdowsi, the absence of a reliable written history of ancient Persia renders research on the cypress tree tenuous. With little exception, until the third empire (224 to 641 CE), ancient Persia relied mainly on oral historiography, “which allowed successive transmitters to rework narratives of events...” (Shahbazi 2012, p. 325) over many centuries. Even in modern written text, the term for a Mediterranean cypress in Persian Farsi, *sarv* (صرف), may also be used to refer to junipers (*Juniperus* spp.) and thujas (*Thuja* spp.) (A’lam 2011).

Persian formal gardens—paradises on earth—are thought to have their roots in the ancient Iranian term ‘Pāiri-daēza’ (Fakour 2012). The sixth century BCE formal garden in the royal quarters at Pasargadae along the Kur River Basin was among the first. A few centuries later, the Greek historian Arrian (86 to c.160 CE) noted that the formal garden contained trees, a stream, and a meadow; however, precise tree species have not been identified (Kidd 2013). The bas-reliefs of trees at the Palace in Persepolis, the center of the Achaemenid Empire, are often assumed to represent cypresses or stylized cypresses (see, for example, Farahmand 2019; Mousavi 2012; Moynihan 1979; Olmstead 1948). However, the images could be other conifers that resemble cypress trees, such as junipers (*Juniperus* spp.), firs (*Abies* spp.), or pines (*Pinus* spp.) (Fig. 2). The use of tree images on this major monument demonstrates conifers, perhaps cypresses, were admired. But the limited contextual information found to date such as cuneiform inscriptions do not identify the specific

type of tree; neither do they provide insight into why conifers were chosen.

Pollen analysis of the Maharlou Lake area in Fars Province, 60 km southeast of Persepolis, demonstrated the growth of species in the Cupressaceae family in general from the late Elamite period to the Achaemenid, and possibly tree plantations (Andam et al. 2021). This botanical family includes not only cypress, but also conifers such as junipers (*Juniperus* spp.) and thujas (*Thuja* spp.) (Djamali et al. 2017).

The strong association of the cypress tree in Persian culture with Zoroastrianism, which is thought to have originated in the second millennium BCE among Iranian tribes in Central Asia (Skjærvø 2014), amplifies the difficulty of determining when the tree became influential. If and how widely the religion was practiced in the Achaemenid is debated, as are the dates of Zoroaster’s lifespan (anywhere between about 1750 and 600 BCE), and whether he was a person or a legend (Henkelman and Redard 2017; Malandra 2009). Zoroastrianism relied heavily on oral traditions for over a millennium, well into the common era. Several Greeks and Romans wrote about Zoroastrianism (Chroust 1965; De Jong 1997). However, the Zoroastrian scriptures, collected in the Avesta, were written down only in the Sasanian Empire (224 to 641 CE). Daryjee (2016, p. 140) summed it up: “We are still in the dark about the development of Zoroastrianism before the fifth century” (CE).

Archeological data related to ancient religion in Persia is lacking and suggests Zoroastrian

Fig. 2. Apadana. East side. Frieze. Persepolis. Sixth–fifth century BCE. Bryn Mawr College, Bryn Mawr, Pennsylvania. Photographed by Machteld Johanna Mellink.



monuments were not used during the Achaemenid (Boyce 2011; De Jong 1997). The oldest Zoroastrian fire temples in Iran have been dated to the Parthian Empire (Kaim 2004); but most temples were constructed during the Sasanian Empire. In the last few years, evidence of Mediterranean cypress timber has been identified in three major Sasanian-era monuments in southwestern Iran, which may have been associated with Zoroastrian fire temples, (Djamali et al. 2017, 2022); however, whether or not the use of cypress trees was related to their availability, properties of the tree's wood, and/or its symbolism, has not yet been determined.

The assumption in some modern scholarship that the cypress tree was influential in ancient Persia, especially in the Achaemenid, seems to be filtered through the late tenth century CE poetry of Daqiqi and Ferdowsi, which relied on both fact and fiction. This assumption needs to be tested by additional research on the precise identity of the conifers at the Apadana complex and the formal gardens at Pasargadae; and/or by finding ancient text, images or wood remains that conclusively associate the tree with Zoroastrianism prior to the eleventh century CE.

THE MEDITERRANEAN CYPRESS IN THE GRAECO-ROMAN ERA—TAKING A DARKER TURN

Alexander the Great's defeat of the Achaemenid Empire around 330 BCE ushered in the height of the Greek Empire. Its boundaries included the Black and Caspian Seas to the north, Libya and Egypt to the south, cities in and around India to the east, and Macedonia and Greece to the west. The Hellenistic Empire was in turn conquered by the Romans in 146 BCE, and by 117 CE the Roman Empire spanned large parts of three continents, including Asia, Africa, and Europe, but not Persia. Native Mediterranean cypress were likely native to the Aegean Islands to the east of the Greek mainland. Although Bagnoli et al. (2009) have suggested the species may also be native to Italy, Maerki and Frankis (2018) have argued it is more likely that the tree was imported into Italy, noting that as early as the seventh century BCE, cypresses were cultivated by the ancient Etruscans, who had commercial relations with Greece and Phoenicia (modern-day Lebanon).

As in other cultures, the Greeks and Romans used decay-resistant cypress wood in buildings

and coffins; it was grown as an attractive ornamental in parks and gardens, and as a windbreak (Bagnoli et al. 2009; D'Auria et al. 2020; Moser et al. 2013). However, it was arguably the deep green foliage of the cypress that most influenced the Graeco-Romans. The tree took on mythological and religious symbolism and became associated with death, funerals, cemeteries, mourning, and the underworld. Current evidence suggests that modern use of the cypress tree in cemeteries that transcend the religions of Judaism, Christianity, and Islam harkens back to the Greeks. The phytochemistry of the cypress also proved beneficial in Graeco-Roman medicine and health.

In both Greek and Roman cultures, the cypress was sacred to the gods, especially to Apollo, the son of Zeus (Jupiter to the Romans). Apollo was associated with the story in which the cypress became a symbol of death and mourning and in which the tree earned its name. In *Metamorphoses* (8 CE) the Roman poet Ovid (43 BCE–17 CE) recounted a Greek myth in which Apollo gave a deer to a young man named Cyparissus. While hunting in the woods, Cyparissus accidentally killed the stag with his spear. Distraught, he asked the gods to end his life. They responded by turning him into a cypress tree. The Roman poet Virgil (70 to 19 BCE) included cypresses in his writing and related them to death and funerals (Connors 1992). Cypress trees were also linked to Hades (Pluto or Dis Pater), gods of the dead, and the kings of the underworld, who were often shown wearing crowns of cypress garland. In *Naturalis Historia* (c. 79 CE) the Greek scholar Pliny the Elder (c. 23 to 79 CE) noted the tree was sacred to Pluto and was used as a sign of mourning placed at the entrance of a house of a deceased person (Bostock and Riley 1855).

In addition to death, mourning, and the underworld, cypress trees became associated with medicine and healing in Greece and Rome. The Greek physician Hippocrates (c. 460 to 370 BCE) recommended cypress be used in a poultice associated with treating proclivencia, or pelvic organ prolapse (Adams, 1868). In *De Medicina*, the second century CE Greek philosopher Celsus mentioned its medicinal properties, including treatment of eye diseases (Spencer 1935). Modern pharmacological research has demonstrated several biologically active compounds from cypress extracts that have a variety of medicinal properties. Al-Snafi (2016) summarized how the species' phytochemical

content—including alkaloids, tannin, and flavonoids among others—contributes to antibacterial, antifungal, antiviral, and other properties. Orhan and Tumen (2015) outlined the polyphenols, terpenes, and essential oils associated with the strong antimicrobial and insecticidal effects of the species.

Apollo's son, Asclepius, appeared in Greek literature as a physician. He was eventually made into a deity, the Graeco-Roman god of healing, and is often shown leaning on a snake-entwined walking stick made of cypress wood (Hart 2000). This rod of Asclepius eventually became the symbol of the medical profession and is used today by the World Health Organization.

The cypress tree even played a role in political discourse. In "Apophthegms of Kings and Great Commanders," the Greek philosopher, Plutarch (c. 46 to 119 CE), wrote of a spat between the Athenian statesman, Phocion (402 to 318 BCE) and the military commander, Leosthenes (c. fourth century BCE). Phocion compared the speeches of Leosthenes to cypress trees and implied they have style but lack substance. "They are tall," said he, "and comely, but bear no fruit." Phocion's metaphor is consistent with the botany of the cypress tree. Its height is impressive and stately; but it is also a gymnosperm, which technically means it does not produce flowers or fruit.

AFTER THE MUSLIM CONQUEST: CYPRESS TREES THROUGH PERSIAN AND ISLAMIC LENSES

Cypress trees accompanied the historical expanse ushered in by the Muslim Conquest, which began in the seventh century CE; continued through the series of dynasties (633 through 1258 CE) that reached into the Arabian Peninsula, and then neighboring countries from the Nile Basin to the western Atlantic Ocean, including Egypt, Spain, and North Africa; and culminated in three Islamic Empires, which covered different geographic areas (Table 4).

The tree transcended the separation of the Muslim religion into the sects of Shia and Sunni, as well as Persian and Arab-influenced countries. It remained especially important in Iran, which had been the center of the ancient Persian Empires, and which became the home of the less expansive Safavid Empire after the Muslim Conquest. The cypress also remained influential in other countries with strong historical ties to Persia—most notably Turkey, Egypt, and Pakistan. Across this sweeping timeline and broad geographic swath, examples of the use and meaning of cypress trees influenced by both the Persians and Islam, include Iranian poetry, miniature paintings, household decorative art and Persian-style formal gardens; Ottoman ceramics, architecture, and literature; and Mughal architecture and painting.

Even after the Muslim Conquest, the Safavid Empire retained many of the artistic and literary traditions of Persia; and Farsi continued to be the dominant language. Religious practices, however, changed as Persia became a majority Shia Islam country versus Zoroastrian. The Qur'an, for instance, made no mention of the cypress made sacred by Daqiqi and Ferdowsi. And yet the tree continued to permeate the Safavid culture.

The cypress was used symbolically and spiritually by the mystical Sufi poets, including Rumi (1207 to 1273 CE) and Hafez (1315 to 1390 CE). While they lived and wrote in what were by then Islamic countries, they were deeply influenced by Persian traditions (Aamir and Pervaiz 2018). Rumi, who remains a best-selling author around the world, referred to cypress trees in several of his poems. In "Where Did the Handsome Beloved Go?" he evoked the cypress' height and attractive shape. In another poem "All Through Eternity," cypress "give hint" of the majesty of Rumi's deity. The fourteenth century poet Hafez honored the tree, arguing that only the cypress was required for his spiritual journey.

Why would my garden choose another tree
above the **cypress**?

TABLE 4. SUMMARY OF THE OTTOMAN, SAFAVID, AND MUGHAL EMPIRES.

Islamic Empire	Geographic reach at height
Ottoman Empire (c. 1299 to 1922 CE)	1550 CE: Transcontinental empire controlling much of South-east Europe, Western Asia, and North Africa
Safavid Empire (c. 1501 to 1736 CE)	1600 CE: Modern-day Iran
Mughal Empire (c. 1526 to 1857 CE)	1690 CE: Indian subcontinent, most notably India and Pakistan

Is the **cypress** I planted myself less than
another tree?

I have a **cypress** in my house.

I don't long for another tree.

The reverence for cypress trees expressed by the Sufi poet Saadi (1210 to 1292 CE) influenced the American writer Henry David Thoreau (1817 to 1862 CE) many centuries later. In Saadi's book, *Gulistan* (1258 CE), the poet wrote about how being like a simple evergreen cypress is superior to being like a date palm, even though the cypress bears no edible fruit. In *Walden*, Thoreau (2004: 79) recounted the story.

Fix not thy heart on that which is transitory;
for the Dijlah, or Tigris,
will continue to flow through Bagdad after
the race of caliphs is extinct:
if thy hand has plenty, be liberal as the date
tree; but if it affords nothing
to give away, be an azad, or free man, like
the **cypress**.

Given the cypress is a gymnosperm, Saadi and Thoreau were botanically correct.

Ferdowsi's *Shahnameh* not only had a major literary influence, it gave rise to a genre of illustrated versions of the epic poem. The well-known *Shahnameh of Shah Tahmasp* was created around 1524 CE during the Safavid Empire. Cypress trees appeared frequently in the illustrations, called Persian miniatures; and were used to represent characters and concepts drawn from Ferdowsi's masterpiece (Dehkordi 2017).

Persian regard for the cypress tree was also integrated into the decorative arts of Islamic households, especially in the Iranian region. Even though the cypress tree is not mentioned in the Islamic scriptures, the fourteenth century CE carved teak Qur'an stand in Fig. 3, which included a cypress tree, provides a prime example of how the tree transcended the Persian and Islamic belief systems.

The cypress tree has been central to the design of Persian textiles. Persian carpets inspired by formal garden designs are believed to go back to at least the sixth century CE during the Sasanian

Fig. 3. Zain Hasan Sulaiman Isfahani, stand for a Qur'an manuscript, c. 1360 CE. The Metropolitan Museum of Art, New York www.metmuseum.org/art/collection/search/446151.



Empire (Conway 1913). The art of carpet-making thrived even after the Muslim Conquest, and the cypress remained influential. The meaning of the cypress tree in textiles varied. In one popular motif, the tree is slightly bent at the top. In Persian culture, this has been interpreted as wind blowing across the tree (Dehkordi et al. 2015). To the Islamic Sufi poets, wrote Aamir and Pervaiz (2018, p 11), “the upright tree, slightly bent at the top, symbolizes the perfect man or prophet’s submissiveness to Allah’s will.”

The classic quadrilateral design for the Persian formal garden, called Chahar Bagh, was well established by Persia’s Sasanian Empire (224 to 641 CE) at the latest (Foltz 2013). The concept of a garden paradise continued after the Muslim Conquest. The term “garden” appears in the Qur’an over 100 times, often associated with paradise on earth and a reward for righteous deeds (Clark 1996). Despite the absence of cypress trees in the Islamic scriptures, they were grown in formal gardens during the Islamic era. Iran’s oldest extant formal garden, Fin Garden, completed in 1590 CE during the Safavid Empire, features cypress trees. It is now a UNESCO World Heritage Site, along with two other formal gardens that include cypresses, Dolat-Abad (c. 1750 CE) and Shazdeh Garden (c. 1850 CE).

During the Ottoman Empire, Persian cultural influence, including cypress trees, was evident in the architecture, ceramics, and illustrations of both Egypt and Turkey. Egypt became an Arabic-speaking and mainly Sunni country. Turkey also became a predominantly Sunni country, but the Turkic language, which is not related to Arabic or Persian, dominated.

Cypress trees were used as a prominent feature in the tilework of Islamic mosques and administrative buildings. The Aqsunqur Mosque (begun c. 1347 CE) in Cairo provides an example where the cypress served as both an artistic motif and spiritual symbol. The cypress tree also adorns the tilework of Istanbul’s Topkapi Palace (begun c. 1456), which was the main residence and administrative headquarters of the Ottoman sultans.

At the height of the Ottoman Empire in the middle of the sixteenth century CE, bright coloring and naturalistic designs, including cypress trees, gained popularity in Turkish pottery (Henderson and Raby 1989). Iznik pottery, for example, named for the city that became the center

of ceramic production in the Ottoman Empire, became status symbols for the elite within the Empire and also found markets in Europe (Carroll 1999).

Just as the Persian poet Ferdowsi created the *Shahnameh* to honor the rulers and culture of Persia, the *Hünername* (1579 to 1584 CE), or *Book of Gestures*, conveyed the history of the sultans of the Ottoman Empire, celebrating their deeds and character (Taner 2020). The *Shahnameh* and the *Hünername* are directly linked. The previously mentioned illustrated *Shahnameh of Shah Tahmasp* (c. 1524 CE) was presented as a gift to the Ottoman court in the sixteenth century (Leoni 2008). In turn, some of the illustrations in the *Hünername* included cypress trees, depicting, for example, formal gardens in the Topkapi Palace (Necipoğlu 1991). However, the cypress did not figure prominently in the narrative of the *Hünername* as it did in the *Shahnameh*.

Babur (1483 to 1530 CE) conquered the Indian subcontinent in the early sixteenth century CE and established the Mughal Empire. A Sunni Muslim from Central Asia, he was well-versed in Persian esthetic traditions (Dimand 1953). Pakistan’s national language was Urdu, but Persian was the official language of the Mughal court. From the advent of the empire, cypress trees became a frequent motif in carpets and tapestries and graced Mughal-style formal gardens (Aamir and Pervaiz 2018).

Cypress trees also figured prominently in Mughal mosques. The seventeenth century CE Wazir Khan Mosque is located in the Punjab Province city of Lahore, once the capital of the Mughal Empire. The motif of a cypress tree entwined with other flowering trees was used to decorate its exterior and interior (Fig. 4). In both Persian and Mughal cultures, this visual metaphor was meant to evoke the idea of the beloved and the loved (Moynihan 1979); and also the “union of the heavenly eternal world with the earthly changing world” (Clark 1996, p. 42). What has become known as the “Cypress Tomb” in Lahore provides another example of the use of the tree in Mughal architecture. The exterior of the mid-eighteenth century mausoleum is prominently embellished with large colorful tile mosaics of cypresses.

Mughal leaders continued the tradition of miniature paintings and the use of cypress trees

Fig. 4. Wazir Khan mosque, detail of faience mosaics on a minaret, c. 1641 CE, Lahore, Pakistan. Photographed by Naela Aamir.



as an esthetic motif. Miniatures painted in the studio of Babur joined Persian and Mughal influences; and once Babur's grandson, Akbar (1542 to 1605 CE), became emperor in the mid-sixteenth century, the scope of influences expanded to include Europe (Dimand 1953). The alliances and geographical position of the Mughal Empire linked it to Central Asia and Persia, as well as to the Dutch, British, and Portuguese (Rogers 2007). Akbar, an avid art collector, exposed his court painters to Flemish and German holy books, while individual merchants brought engravings of classical nudes and mythical subjects (Minissale 2000). The novel, cosmopolitan style that resulted was reflected in painting on the subcontinent from that time on. For example, cypress trees appear in the *Babarnama*, the illustrated memoirs Akbar commissioned to honor his grandfather; the *Akbarnama*, which chronicled Akbar's rule; and the albums of the emperor who followed Akbar, Jahangir (1569 to 1627 CE).

THE MEDITERRANEAN CYPRESS IN WESTERN EUROPE—BRINGING THE PAST FORWARD

Through occupation or alliances, the Persian, Greek, Roman, and Islamic Empires influenced the use and meaning of cypress trees in Western Europe from the late sixteenth century through the twentieth century CE. The tree appeared in several of Shakespeare's plays, including

Henry VI, Taming of the Shrew, Coriolanus, and *Winter's Tale* (Onions 1911), where his association of the cypress tree with death, sadness, and mourning was aligned with the earlier use of cypress by the Greeks and Romans. Italian artist Domenichino (1581 to 1641 CE) commemorated Ovid's myth in his fresco, "The Transformation of Cyparissus." Spanish painter Diego Vélasquez's (1599–1660 CE) masterpiece, "View of the Gardens at Villa Medici," widely viewed as presaging nineteenth century impressionism, used cypress trees as an artistic vehicle (Harris 1981). Many European artists in the nineteenth and twentieth centuries CE also used cypress trees in their paintings, among them Auguste Renoir, Paul Gauguin, Vincent van Gogh, Edvard Munch, Amedeo Modigliani, Henri Matisse, Joseph Stella, and Salvador Dalí. Their interpretations of the tree chronicled the evolution of artistic styles over this period, from impressionism to surrealism.

Just as the Mughal miniatures were influenced by European art, Henri Matisse noted how influential the Persian painters were on his evolution as a painter. Matisse's "Landscape Viewed from a Window" (1911–1912, Pushkin Museum) captures a view of the Moroccan city Tangier as seen from the artist's hotel window, including cypress trees. Matisse was influenced by Persian miniatures, an exhibition of which he saw in Munich in 1910, a year before this trip to Morocco. These opened his mind to new ways

of juxtaposing objects in his paintings in unique ways, which he did in much of his work. In his own words (Flam 1978, p. 116), “the Persian miniatures showed me the possibility of my sensations. That art had devices to suggest a greater space, a really plastic space. It helped me to get away from intimate painting.”

Vincent van Gogh was the modern European painter who arguably most exalted trees. While he painted a number of deciduous and evergreen species, his paintings featuring cypress trees are considered to be among his finest works. The hundreds of extant letters he wrote, many to his brother Theo, have provided art historians with insights into his artistic approach, motivations, and influences.

Trees held emotional significance and spirituality for Van Gogh. “In all of nature,” he wrote, “in trees for instance, I see expression and a soul, as it were” (Skea 2013, p.15). He often used trees symbolically, to convey decay and death or alternately rebirth and hope. Identifying God with the natural world, Van Gogh believed nature would lead to contact with the sublime. Trees were not inert objects to him, but fellow creatures, with which artists should empathize.

Van Gogh turned to painting cypress trees in spring 1889, about a year before he died. “Starry Night” was created during this period. Describing the tree to Theo he said, “It’s beautiful as regards lines and proportions, like an Egyptian obelisk. And the green has such a distinguished quality” (Skea 2013, p.105). Beyond form and color, whether Van Gogh used cypress trees for symbolic purposes remains unknown. Art historians have noted how the trees seem to bridge the earth and sky, and life and death (Jirat-Wasiutynski 1993). While the artist did not specifically associate his use of cypress trees with death or immortality in his letters to Theo, Van Gogh’s likening of the cypress to an Egyptian obelisk is intriguing given that in ancient Egypt it symbolized immortality.

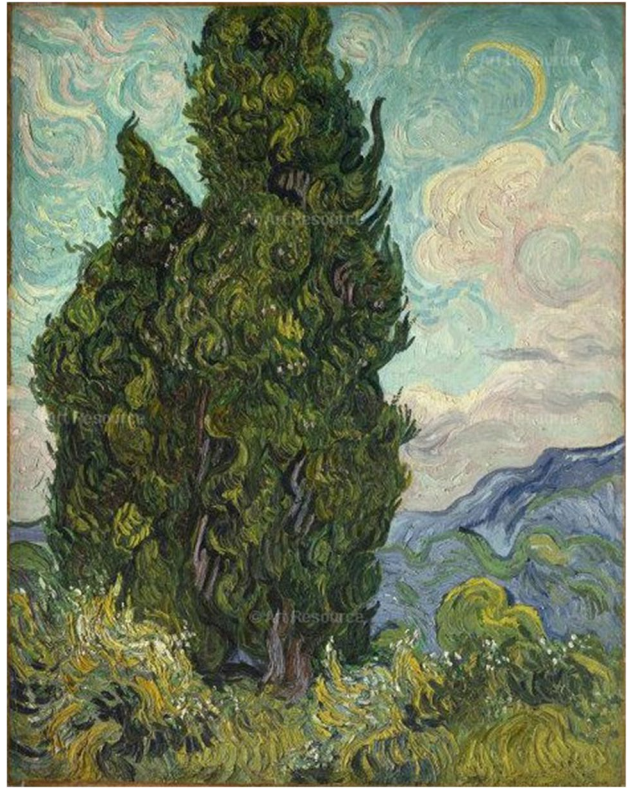
Van Gogh painted “Cypresses” a week or two after “Starry Night” (Fig. 5). “The whole canvas,” art critic Sebastian Smee (2021) wrote, “the sky, the clouds, the atmosphere itself - seems to vibrate in response to the cypresses’ life force, evoking all the ways in which the natural world is interconnected... it enacts Van Gogh’s special apprehension of nature’s reverberating oneness.”

Conclusions: the Mediterranean Cypress Endures

Once limited to the Northern Hemisphere after the break-up of Pangaea and native to the Eastern Mediterranean, today the Mediterranean cypress tree has a ubiquitous presence as an esthetic and symbolic motif in literature and fine art, a source of aromatic and pharmacological compounds, an ornamental in gardens and cemeteries, and a windbreak. Many of the artifacts, artworks, and literature known to be influenced by the cypress are cultural icons: the Gudea cylinders, the outer coffin of Pharaoh Tutankhamun, the poetry of Virgil and Ferdowsi, Topkapi Palace, Shakespeare’s plays, and the paintings of Vélasquez and Van Gogh. The tree’s inspiration has also leapt across time and place. The sixteenth/seventeenth century Italian painter Domenichino drew from the ancient Greek myth of Cyparissus; the nineteenth century American writer Henry David Thoreau from the thirteenth century Persian poet Saadi; and the nineteenth/twentieth century French painter Matisse from the Persian miniatures.

The cypress not only evokes the ways in which the natural world is interconnected, but also the ways in which the evolution of human cultures is interconnected. This review had demonstrated that the Mediterranean cypress is best viewed through a kaleidoscopic lens: as it spanned geography and time, and as cultures emerged and were eclipsed or assimilated by others, the uses and meanings of the tree were layered and sometimes changed. The ancient Sumerians made use of the tree’s decay-resistant wood and chemical content in construction and as an aromatic anointment. The wood’s durability and longevity were well-suited to the ancient Egyptian belief in the afterlife and thus saw use in coffins and tomb furniture. The tree became seminal to Persian culture: as a revered evergreen and long-lived ornamental, a sacred tree of Zoroastrianism, and a potent literary symbol that celebrated the tree’s beauty and height. In Graeco-Roman times, the deep green foliage of the cypress led to its symbolism in death and mourning. The cypress transcended the incorporation of Persia into the Muslim world and became a centerpiece in gardens and as a motif in artifacts, architectural tilework, and illustrations in the Safavid, Ottoman, and Mughal Empires. By drawing on

Fig. 5. Vincent van Gogh, *Cypresses*, 1889 CE, oil on canvas, 36 3/4 × 29 1/8 in., The Metropolitan Museum of Art, New York, NY. Art Resource, NY www.metmuseum.org/art/collection/search/437980.



Persian, Indian, and European influences, the Mughal miniature tradition especially was a harbinger for broader cultural integration. During the late sixteenth and early seventeenth centuries, Western European writers and artists drew from Graeco-Romans' dark interpretation of the cypress tree; while modernist painters in the late nineteenth and early twentieth centuries relished the ways in which the height, shape, and color of the tree enhanced their compositions.

Much more about the botany and cultural influence of the cypress remains to be unearthed and analyzed. In the botanical realm, understanding of the native, naturalized, and introduced ranges will be enhanced as new fossil evidence comes to light and techniques like DNA sequencing provide additional insight. Fossil evidence might also clarify whether the fastigiate form is a botanical variety or cultivar. Accurate dating of existing cypress trees and forests, especially those in Iran, will help determine if they were alive during, or even prior, to the Achaemenid Empire.

The knowledge gaps that surfaced in this review offer many avenues for inquiry related to ethnobotany. Identification of the tree species on the Proto-Elamite seal, the Persian Apadana complex in Persepolis, and the formal gardens at Pasargadae would provide more confidence in the importance of the cypresses in these ancient cultures. Similarly, more refined identification of the species in Egyptian gardens is needed to link the cypress tree reliably to the symbolism of immortality. Surfacing evidence that associates the tree with Zoroastrianism prior to the eleventh century CE would demonstrate the tree's spiritual importance prior to the work of Daqiqi and Ferdowsi. Enhanced understanding of trade patterns of cypress wood and germplasm between countries in which the tree was native and non-native is needed. Additional research that drills down to the specific uses and meanings of the cypress motif in Persian versus Islamic-style formal gardens, decorative art, and painting would demonstrate more deeply where these overlap

and diverge. Given Van Gogh's reverence for trees in general, research focused on his cypress trees would elucidate whether he used it purely as an artistic motif or perhaps a spiritual symbol associated with immortality or perhaps his imminent death.

Surfacing and analyzing new evidence that predates the Proto-Elamite seal would fill in several millennia between that culture and the initial wood remains of cypress wood associated with the Natufian culture. Additional evidence may confirm speculation that the cypress tree played a role in Judaism and Christianity: as wood used in Noah's ark, the cross of Jesus, and the original doors of St. Peter's Basilica in Rome. Discerning whether or not the tree was mentioned in ancient biblical texts is challenging given countless versions and translations into different languages. What is not yet known definitively about the species suggests keeping an open, yet critical, mind.

The Mediterranean cypress tree's botanical and cultural significance is unequivocal. Its origins in the break-up of the supercontinent Pangaea have aided understanding of plant evolution. Its botanical characteristics have helped define the *Cupressus* genus more broadly. The economic and socio-cultural longevity of the tree has followed the winding course of much of human civilization and continues to do so. Creating a comprehensive and accurate understanding of what is currently known about the species has required cross-referencing insights from many disciplines: botany, paleontology, archeology, anthropology, economics, garden history, literature, and art history. Studies of other plant species might also benefit from this holistic and interdisciplinary approach.

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