

Psychoactive plants in ancient Greece

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ABSTRACT

Introduction. Various literary and archaeological references point to extended use of different psychoactive plants along the eastern Mediterranean region. This article reviews key evidence of the use of psychotropic plants in ancient Greece.

Research. The opium poppy (*Papaver somniferum*) has been used since the Bronze Age or earlier. Opium was used to induce somnolence in the incubation rituals practised in the temples of Asclepius (Asklepios). Nepenthe, described by Homer in the *Odyssey*, was probably an opium-based preparation; opium had been introduced to the Greeks by way of Egypt. On Crete, a Minoan shrine (1300 BCE) dedicated to the “poppy goddess” of fertility and health was discovered in the village of Gazi. Numerous golden seals from Mycenae and Boeotia show images of states of ecstasy associated with poppy consumption. Ritual inhaling of cannabis smoke arose on the steppes of Asia. Herodotus (5th century BCE) described rituals of inhaling cannabis smoke among Scythians and Massageteans. Initiates in the Eleusinian Mysteries (1500 BCE–4th century CE), took kykeon, a psychoactive secret potion. It is thought that kykeon contained hallucinogenic substances that induced visions and the state of ecstasy associated with the Mysteries. Rye ergot, which contains lysergic acid amides, may have been one of the ingredients of the drink.

Conclusions. In the Archaic period in Greece, poppies, cannabis, and other plants such as henbane or datura were used for ritual and medicinal purposes.

KEYWORDS

Asclepius, *Cannabis sativa*, *Claviceps purpurea*, history, Greek medicine, opium, *Papaver somniferum*.

Introduction

Hallucinogens are substances that provoke false sensations or distort perception of the environment (creating illusions) without causing loss of consciousness when taken in normal, non-toxic doses.¹ They are also known as entheogens (substances that stimulate mysticism or divine communication). This word comes from the Greek roots *en* (full of), *theo* (god), and *gen* (create). Numerous cultures have used these substances throughout history, and at present, many different ethnic groups still take part in rituals associated with the use of entheogenic plants. For example, mescaline and psilocybin-rich mushrooms are used by a number of Mesoamerican cultures. *Amanita muscaria* and *Ephedra sp.* were once used in Indo-European religious rites. They were probably included among the ingredients of *soma*, the sacred drink in the Rigveda, and *Haoma*, used in the ancient Zoroastrian religion.^{2,3}

Various literary and archaeological references point to extended use of different psychoactive plants throughout the Eastern Mediterranean region. The purpose of this article is to review key evidence of psychoactive plant use in ancient Greece and the cultural origins of such use.⁴

Analysis

1. Ancient Greek medicine

Asclepius, god of medicine

In Greek mythology, Asclepius was revered as the god of medicine. The son of Apollo and the mortal woman Coronis, Asclepius possessed the gift of healing. According to Pindar (6th century BCE), Apollo made love to Coronis, daughter of the king of Thessaly. When he departed for Delphi, he left her guarded by a

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white crow. Some time later, the crow informed Apollo that Coronis had taken a new lover, the mortal man Ischys, to whom she was now betrothed. Apollo then cursed the crow, which has had black feathers ever since (Figure 1), and murdered Coronis. Before burning her body on a funeral pyre, Apollo snatched his son Asclepius from her womb.



Figure 1. The god Apollo offering libation, shown with a black crow. Museum of Delphi.

Asclepius was raised and educated by the centaur Chiron, who taught him the art of medicine, the use of medicinal plants, and *pharmaka*.⁵ But Zeus, envious of his healing powers and ability to resuscitate the dead, ended his life. After death, Asclepius rose to the heavens and became the constellation known as Ophiuchus, the serpent bearer; his symbol is a serpent entwined around a staff (Figure 2).

His sons Machaon and Podalirius continued practising the medical arts their father had taught them. They were considered lesser gods, and Machaon is associated with surgery. A passage in the Iliad narrates how Menelaus sustained an arrow wound and was cured by Machaon.⁶

The daughters of Asclepius included Hygieia (the personification of health), Panacea (associated with universal cures), and Iaso (the goddess of recuperation).

Apollo was also considered an oracular god, and a major temple was dedicated to him in his sanctuary at Delphi, where the Pythia or oracle revealed her visions or predictions of the future. Apollo had the power to summon illnesses in the form of plagues (the so-called arrows of Apollo), and also to cure them.



Figure 2. Asclepius, Greek god of medicine. National Archaeological Museum of Athens.

The Asclepeia

The figure of Asclepius was venerated in ancient Greek medicine, and his successors practiced his art in a network of sanctuaries and healing temples named asclepeia (singular, asclepeion or asklepieion). Temples were often located near a spring or river whose waters were said to have medicinal powers. The shrine of Asclepius in Epidaurus was probably the most important during this period; other major shrines were located at Kos, Knidos, and Pergamum.

Within these healing temples, the sick made a series of offerings and sacrifices to Asclepius and underwent rituals including one-day fasts, three days of abstinence from wine, baths, and massages. The different buildings in the healing temple contained areas for physical exercise and special rooms for the sick. After finishing their purification rites, the sick were led to the abaton or incubation chamber where they would participate in a practice called 'dream incubation'. Asclepius would appear to a fortunate few in their dreams and cure them by touching the ailing part of their body (Figure 3). On other occasions, Asclepius appeared in the dreams of the

sick and informed them of what was causing their distress or provided a list of remedies that they should take upon waking. Numerous offerings and votive deposits were left in the temples in thanks for cures provided by the god. The ex-votos that have been found inform us that Asclepius cured many diseases, treated ulcers and kidney stones, and restored sight to the blind indicate that sleep may have been induced by narcotics whose effects did not include the stupor provoked by the solanaceae family or the visionary trances caused by cannabis. With this in mind, opium is believed to be the main narcotic agent used in dream incubation.



Figure 3. Scene of a dream incubation in which Asclepius appears. Epidaurus.

Theurgic medicine

Ancient medicine was based on mythological beliefs and the idea that human beings were inferior to a divine power. Sickness was interpreted as punishment by the gods, and such punishment could either be collective (plagues, arrows of Apollo) or individual (leprosy, blindness, insanity). Some sick people might be possessed by a malignant spirit or *daimon*, or as in cases of epilepsy, suffer from the effects of a curse.

Theurgic medicine in ancient Greece was magical in nature and concerned with both prognosis and prevention; it also made use of a number of rituals. The Greeks practiced apotropaic magic and obtained the gods' favours through ritual sacrifices. Rites of propitiation and atonement were used in an attempt to ward off sickness. Additionally, the Greeks used rites of *katharsis* to purge illness from the sick. This cleansing ritual made use of river water, although at times purification was achieved by using fire.

The practice worked by the principle of analogy; it was believed that like followed like. Animals could therefore be used as vessels for illnesses, and their entrails were used after they were sacrificed. Logotherapy, healing with words, supplication, invoking the gods, commination, *epode* and exorcism were yet other methods used by the priests at the Asclepeia, who served as intermediaries between patients and the gods. *Niktiday* –ceremonies with music and dancing– and nocturnal dances to purge the body of illness were used in this ritual context. An example of the magical approach to healing in ancient Greek medicine is the story of how Melampus healed the daughters of king Proetus by splashing pig's blood on their foreheads; the girls had been driven mad after refusing to participate in the rites of Dionysus.

From Homeric medicine to the Pre-Socratic era

While use of healing temples was on the rise, botanical remedies for treating wounds were also being developed. Homer's Iliad contains a remarkably large anatomical vocabulary with more than 150 words, including *kranion*, *osea*, *sphondyloi*, *pleurai*, *brakhion*, *yugulum*, *eakhis*, and *splankna*. It also describes nearly as many wounds with high mortality rates and in various locations, including the head, thorax, abdomen, limbs; most were caused by lances, while others were caused by swords and arrows. In the Iliad, Homer relates how Achilles treats and bandages the wounded arm of his friend Patroclus, which indicates a certain familiarity with techniques for treating war wounds.

Later on, in the 6th century BCE, secular schools of medicine began to be founded which distanced themselves from the temples of Asclepius and their magical and spiritual approach. This was the birth of pre-Socratic and pre-Hippocratic medicine, which was further developed at the schools of Knido and Cos.

These schools began using a scientific approach to analysing symptoms, formulating the diagnosis, determining the prognosis, and prescribing treatment. These medical schools, which predate Hippocrates, would come to recognise that not all illnesses are curable and that no doctor can turn aside fate.

But prior to this, in the Archaic period, numerous psychoactive plants were used to induce visionary or trance states within a context of magical and religious rites, as described in the following section.

2. *Papaver somniferum*

Ethnobotany

The opium poppy is an annual herbaceous plant found throughout the entire Mediterranean region. Its mature encapsulated fruit and its sap contain a high concentration of alkaloids. Extracted opium, a word of Greek origin meaning 'juice', has an alkaloid content of approximately 10% to 20%, and a mineral content of 6%; sugars and organic acids account for 20%. In contrast, its seeds do not contain alkaloids.

Two types of alkaloids have been isolated in opium: phenanthrene derivatives (morphine, codeine, thebaine) and isoquinolines, derived from tyrosine with a benzyliisoquinoline nucleus. Morphine, a name derived from the god of sleep Morpheus, accounts for 10% of the total alkaloids in opium, while codeine (methyilmorphine) and thebaine (dimethyilmorphine) account for 0.5% and 0.2% respectively. Alkaloids derived from benzyliisoquinoline have a spasmolytic effect. Papaverine is the main alkaloid in this group, and it accounts for 1% of the total alkaloids in opium.⁷

The effects of opium are mainly due to its principal alkaloid morphine, which produces a sense of euphoria, happiness, and well-being, while at the same time lessening pain and inducing a state of drowsy contentment. Opium poppy consumption may cause nausea, vomiting, constipation, and headaches as side effects; users may also develop a tolerance and experience physical dependence.

The technique for obtaining opium was developed in Neolithic times and remains virtually unchanged today. The process begins about two weeks before the plant's leaves fall, when the poppy seed capsule is hardening. At dusk, the poppy seed capsule is scored with small incisions that allow its latex to flow out. The next morning, an iron tool is used to remove a brownish paste, which is later made into powder.

Historical and archaeological findings predating those in Greece

The oldest poppy capsules on record come from a Neolithic village in Switzerland. In Spain, capsules from *Papaver somniferum* dated to 4200 years ago were found in bundles from a burial hoard at Cueva de los Murciéla-

gos, Albuñol, in the province of Granada. Nevertheless, the oldest evidence of ritual therapeutic use of the poppy is a Sumerian text from Mesopotamia, which describes it as the plant of happiness. Sumerians grew poppies and harvested their opium some 3000 years before the Christian era.

Poppies were known in ancient times along the Mediterranean basin and also in the Near East. Literary sources and archaeological evidence point to poppy use in the eastern Mediterranean region in the Late Bronze Age. Ritual artefacts associated with poppy use have been found in Cyprus, Crete, continental Greece, Syria, and Egypt. A ritual vessel containing poppy seeds was found in the ruins of Beycesulan, an Anatolian palace destroyed in the 19th century BCE. Plantations were yielding opium in Thebes as long ago as the 15th century BCE. Egyptian-produced opium was called Thebaic opium ('thebaine', the name of one of the opium alkaloids, is derived from this name). Opium was used as a narcotic and sedative in Egypt during the reign of Amenhotep III. An alabaster vessel containing vegetable oil and opium was found in the tomb of the architect Kha. The Ebers papyrus (1500 BCE) refers to medicinal use of the opium poppy. The text recommends using an opium-based preparation for calming children who shouted or cried too much, and relates that Isis had used it to soothe her son Horus.⁸

Poppy use in Greek texts

Homer's writings refer to the effects of a number of philtres and potions made from different ingredients dissolved in wine. Nestor's drink in *The Iliad*, and the nepenthe referred to in *The Odyssey*, both fit this description.

Homer is credited with the first mention of poppies in Greek literature (*The Iliad*, Book VIII, 306), with this poetic reference: "as when a poppy in the garden drops its head to one side, weighed down with its fruit or with the spring rain, so his head fell to one side under the helmet's burden". Nepenthes pharmakon was probably an opium-based concoction introduced to the Greeks by way of Egypt. Homer tells us that during a banquet given by Menelaus in Telemachus' honour, Helen adds a philtre to the wine to allay the guests' sadness at remembering Ulysses. This was the drink of forgetfulness erasing all sadness, as indicated by the meaning of the Greek particles *ne* (not) and *penthes* (pain), that which ends sadness.

Helen would have learnt the formula from Polydamna of Egypt, since Thebaic opium was valued highly by the Greeks; it was said that countless poppies grew in the fertile land of Thebes. At later dates, other Greek writers mentioned the poppy (*mekon* in Greek). For example, Hesiod in the 7th century BCE speaks of Mecone (or Mekone), a city near Corinth named for the opium poppy. Strabo provides further details and informs us that Mecone was the old name of Sicyon. In turn, Herodotus compares the poppy to the Egyptian lotus. Pausanias related that a statue of Aphrodite holding a poppy flower was raised near the shrine of Asclepius in Sicyon; “the seated image is the work of Canachus of Sicyon. It is wrought in ivory and gold, bearing a sphere on the head, and having in the one hand a poppy and in the other an apple”.

In his essay “On Government”, Heraclides Ponticus (4th century BCE) stated that the ancients practiced euthanasia using opium. Furthermore, in the 2nd century BCE, Theophrastus in his *Historia Plantarum* describes different poppy varieties, ways of extracting latex, and opium’s medicinal uses. Theophrastus refers to the latex from the poppy as ‘opium’, using the term *mekonio* to designate its juice.

In the Hippocratic Treatises, Hippocrates recommends using poppy juice to treat a number of complaints, including leucorrhoea and dropsy of the womb. He indicates poppy ointment for treating eye problems. Hippocrates’ *Diseases of Women* recommends using the black poppy (*hypnotikon mekonion*). He described the formula as follows: “Pound the poppy with a pestle, add water, and strain. Mix the paste and toast the mixture. Then add boiled honey and give to patients with dropsy. Later, have them drink watered sweet wine or very weak mead, or store poppy juice and use it in your treatments”⁹ In both this treatise and in *Precepts*, the author mentions *opos* (the juice) of the poppy and classifies it as a hypnotic sedative agent, along with nightshade and poppy pods.

In the 3rd century BCE, members of the Empiric school, especially Heraclides of Tarentum, were deeply interested in psychoactive plants, and used opium to lessen pain and induce sleep. In this way, poppy juice made a name for itself as a prototypical *alexipharmaka*, or protective medicine. In contrast, in the 2nd century BCE in Pergamum, Nicander of Colophon described the drug’s toxicity and stated that a lethal dosage of Thebaic opium could be as low 2 drachmas (7 g), with death certain to

occur with 3 drachmas. At a later time, Scribonius Larius, physician to Emperor Claudius, rediscovered the Assyrian method of making incisions in the poppy pod and described it in his treatise *Compositiones Medicamentorum*.

Archaeological evidence of poppy use in Greece

Archaeological evidence indicates that *Papaver somniferum* was used in ancient Greece. On Crete, a Minoan shrine dating to 1300 BCE and dedicated to the “poppy goddess” of fertility and health was discovered in the village of Gazi. The statues of the poppy goddess are a series of female figures with bell-shaped bodies and uplifted arms; they are crowned with diadems of poppy heads, which are used for making opium. These sculptures have been found in underground chambers, along with tube-shaped vessels used for inhaling opium smoke.

The religious significance of the Poppy Goddess of Crete can be seen when we scrutinise the cut lines represented on the poppy heads on the statue; evenly-spaced vertical cuts are used to harvest opium, which shows that the extraction technique was highly developed, and that opium was taken for ritual purposes.¹⁰ The statue was found in a closed chamber with no doors or windows, but rather an access through the ceiling; the chamber also contained traces of charcoal. It is therefore believed that priests and followers of the goddess also experienced the effects of opium.

Terracotta figures of the poppy goddess of Crete, whose expressions reflect a trance-like state, may be the first evidence of ritual use of *Papaver* by using pipes or inhalers. The technique of inhaling opium smoke may have been used at a later date in the temples of Asclepius during dream incubation.

An ivory pipe 13 cm long, dating back to the 12th century BCE and used to smoke opium, was discovered in Kition, Cyprus, along with other ritual artefacts. During the Late Bronze Age, Cyprus was able to coordinate an opium production and distribution network which supplied civilisations near the eastern Mediterranean, especially Egypt.

Ceramic artefacts representing poppy heads have been dated back to the Mycenaean Age (BCE 1500). Royal tomb III at Mycenae contained a metal ornament, perhaps a brooch, in the shape of a poppy. The golden

seals of Mycenae and Thisbe (Boeotia) show images of trance states in which the poppy is shown in association with female deity linked to some type of tree worship. One of the seals from the famous Treasure of Mycenae discovered by Schliemann shows several female figures presenting poppies and other plants to a seated goddess; this may be Demeter giving seeds to her daughter Persephone (Figure 4). On one of the seals from Thisbe, a female worshipper presents poppy heads to the goddess. On another seal, a female figure emerges from the earth bearing poppy heads; this is the Earth Goddess, symbol of fertility. Lastly, the Isopata gold signet ring, found in Crete and dated to BCE 1500, depicts four female figures worshipping a goddess. The signet bears the disembodied eye, an image representing the consumption of hallucinogens accompanied by ecstatic visions.



Figure 4. Mycenaean ring showing a trance state associated with poppy use. National Archaeological Museum of Athens.

Poppies and the gods

In Classical Greece, the opium poppy was used for sacred and profane ends, and it had both medicinal and nutritional properties. Poppies were associated with the gods in Classical Greek mythology. The ancient Greeks associated fertility and abundance with the poppy, which in turn was associated with the goddess Demeter.

Demeter was therefore often depicted with opium poppies and sheaves of wheat and barley (Figure 5). Persephone (Kore) and Narcissus are also associated with the poppy. Persephone is often shown rising from the underworld with a motif of poppy heads and lily leaves.

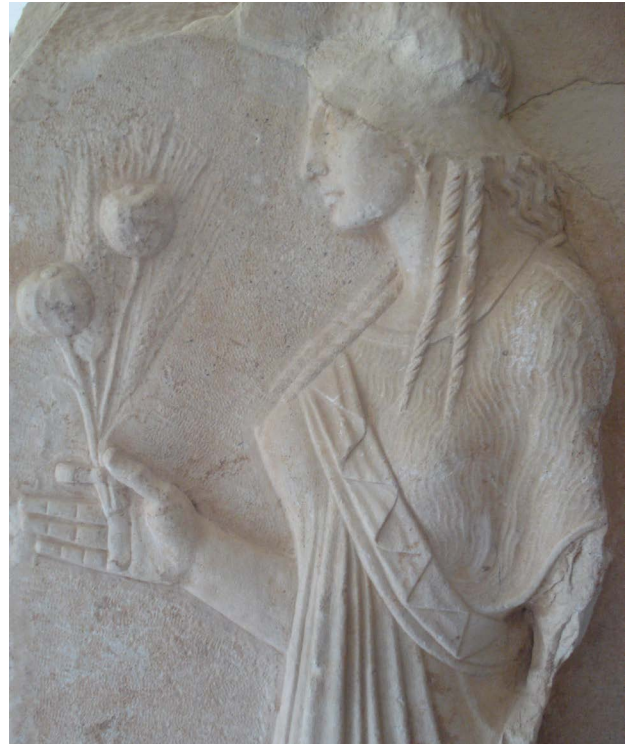


Figure 5. Demeter bearing ears of grain and poppy heads. Archaeological Museum of Ancient Corinth.

3. *Cannabis sativa*

Ethnobotany and properties

Hemp or *Cannabis sativa* has been used since antiquity for making cloth, foodstuffs (seeds), and psychotropic resins for any combination of medical, ritual, or spiritual purposes. Archaeological and ethnobotanical evidence shows that it has been used for more than 5000 years.

The three basic types of prepared cannabis are known by their Hindi names: *bhanga*, a mixture with dry cannabis seeds and shoots (“grass”); *ganja*, unfertilised, seedless flowers of the female plant; and *charas* or *hashish*, cannabis resin.

Cannabis is made up of more than 400 alkaloids and substances extracted from *Cannabis sativa*. Some 60 compounds, called cannabinoids, act on the cannabinergic system; the most abundant are Delta-9-tetrahydrocannabinol (D9THC), cannabidiol, and cannabiol. D9THC is the main cannabinoid with psychotropic activity, and it was isolated in 1964.

Smoking cannabis is a relatively inefficient delivery

method, since 70% of the D9THC is destroyed by pyrolysis. Historically, the oral route of administration was the most common. However, orally ingested cannabinoids are heavily metabolised at first, and as a result, only 10% to 20% of the dose taken orally actually reaches systemic circulation. The clinical peak effect is reached one to two hours after oral administration, and the effect lasts four to six hours. In contrast, delivery by the respiratory route has an almost instantaneous effect that is perceived within seconds.¹¹

Cannabis has a euphoric and relaxing effect, although it may also cause sensations of panic and anxiety the first time or times it is consumed. In high (toxic) doses, it can cause changes in temporal perception and orientation, intensify sensory experiences, and decrease attention, reaction time, and motor abilities. Physiological changes due to cannabis intoxication include tachycardia and postural hypotension. However, the overall toxicity of cannabis is relatively low due to the short duration of its effect. Cannabis is frequently used along with tobacco in order to increase the efficiency of its effect.¹¹

History

Cannabis sativa was one of the most widely-used psychotropic plants known to the ancient world. Hemp was found in the steppes of central Asia and in China, where it was already being cultivated some 5000 years ago in order to obtain textile fibres. Hemp farming was necessary in order to make bridles for horses in these cultures, which domesticated horses at least 6000 years ago.¹² Ritual inhaling of cannabis smoke may have originated on the steppes of western China, along the shores of the Caspian sea, and western Iran; here, cannabis was employed to reach a sacred state of intoxication in religious rites. *Bangha* is an old term from Persia that was used in central Asia and India; in Sanskrit, it designated the plant which the god Shiva obtained from the ocean and used to promote meditation. The properties of cannabis were also known in Mesopotamia, and the Assyrians called it *quunabu*. Central Asian civilisations, such as the Scythians, Thyssagetæ, Thracians, and Massageteans used it in numerous rituals.¹²

Cannabis in Greek texts

In the 5th century BCE, Herodotus wrote that inhaling cannabis smoke was a custom among Scythians and Massageteans of the steppes in purification rites held af-

ter the death of a member of the group. He described the practice thus:

The Scythians...take some of this hemp-seed, and, creeping under the felt coverings, throw it upon the red-hot stones; immediately it smokes, and gives out such a vapour as no Grecian vapour-bath can exceed; the Scythians, delighted, shout for joy, and this vapour serves them instead of a water-bath... (Herodotus, 4.75).¹¹

In his treatise *Geography*, Strabo indicates that this plant grew abundantly in Kolkhis. He also mentions the *Kapnobatai misios*, "those who walk in smoke", referring to Getæ dancers who burned cannabis flowers to reach states of ecstasy. Dioscorides, on the other hand, made no mention of its psychoactive properties. Instead, he records its use as a textile fibre and remedy for earache, and recommends direct application of the plant's juice for that purpose.

Galen repeats Dioscorides' advice for otalgia and remarks on the intoxicating properties of the seeds. He states that some people consumed hempseed in sweets and desserts at important banquets in order to awaken pleasure and arousal.

Archaeological evidence

The practice of burning cannabis so as to feel its narcotic effects is a Caucasian tradition between 5000 and 6000 years old. It may have been the key event in social and religious rituals among nomadic herding groups in Eurasia in the Neolithic period and the Bronze Age. The oldest evidence comes from a pit grave at Gurbănești, Bucharest, where a brazier containing traces of hemp seed from the third millennium BCE was discovered.

Archaeological confirmation of cannabis use comes from a number of Scythian tombs and burial sites found in Pazyryk in the Altai Mountains of Siberia. Here, archaeologists uncovered metal braziers containing carbonised traces of hemp seed which have been dated to the 4th century BCE.¹³ Scythian artefacts including tent frames, leather coverings, bronze vessels and cannabis seeds from the same period have also been found. As Herodotus informs us, it seems that the Scythians had the custom of throwing hemp leaves and flowers on the fire, and while those parts of the plant contain psychoactive alkaloids, seeds are leftover material with no psychoactive properties. A tomb containing a mummified shaman of the Gushi people was discovered in the Gobi

desert site of Yanghai. His remains were entombed with bridles, hunting bows, a harp, and a small bundle containing nearly 800 grams of cannabis.¹⁴ The Ukok site near the Altai Mountains revealed the mummified remains of a Scythian princess from the 5th century BCE. Her burial hoard contained traces of coriander, *Coriandrum sativum*, which when consumed can also cause a certain degree of intoxication.

4. *Claviceps purpurea* and the Eleusinian Mysteries

The myth of Demeter and Persephone

The Eleusinian Mysteries were some of the most famous religious rites of Ancient Greece, in addition to being some of the most secretive. They were celebrated during nearly two millennia, from 1500 BCE until the 4th century CE (Figure 6). In the city of Eleusis, near Athens, participants honoured the goddess Demeter and recalled the abduction of her daughter, Persephone, by Hades the god of the underworld.

According to the epic poem known as the Homeric Hymn to Demeter, the goddess stripped the earth bare of its vegetation to punish the gods of Olympus. Zeus and the other gods begged her to restore the earth's fertility, and Zeus ordered his brother Hades to let Persephone rejoin her mother on earth; when she returned, in the springtime, the vegetation came to life. Nevertheless, Persephone had to spend a third of every year in the underworld, since she had eaten fruit from the kingdom of Hades. Demeter is associated with agricultural abundance. According to this myth, she gave the first grains of wheat to Triptolemus, the oldest son of Metanira, and taught him the secrets of agriculture.¹⁵

The Eleusinian Mysteries

During the celebration of the Greater Mysteries, pilgrims journeyed from Athens to Eleusis and participated in a night-time ceremony involving drinking *kykeon*, a specially prepared hallucinogenic beverage. Participants who experienced marvellous visions were known as *epoptai*, or beholders. Famous figures including Plato, Aristotle, Pausanias, Sophocles, and Pindarus participated in the Eleusinian Mysteries.

Public sacrifices, rites, and purification ceremonies were performed during the procession associated with the Eleusinian Mysteries. When the procession arrived at

Eleusis, initiates fasted for a day to commemorate the fast of Demeter while she searched for Persephone. This fast was only broken to take *kykeon*.

The Eleusinian ceremony, the most secret part of the mysteries, was celebrated in the great hall called the Telesterion on the night of the holiest day. Initiates participated in this visionary mystery only once in a lifetime, and were forbidden to reveal the content of the ceremony under pain of death.¹⁵



Figure 6. Eleusinian Mysteries. National Archaeological Museum of Athens.

Greek sources

The Homeric Hymn to Demeter describes the moment of initiation as follows:

Then Metaneira filled a cup with sweet wine and offered it to her; but she refused it, for she said it was not lawful for her to drink red wine, but bade them mix meal and water with soft mint and give her to drink. And Metaneira mixed the draught and gave it to the goddess as she bade. So the great queen Deo received it to observe the sacrament.¹⁹

Claviceps purpurea, an ingredient in kykeon

Kykeon was regarded as a secret potion that the enlightened ones were to take before initiation. It is thought that kykeon may have contained hallucinogenic substances that induced visions and the state of ecstasy associated with the Eleusinian Mysteries. By this method, initiates would enter a trance state, which was exacerbated by fasting and the preceding rituals.

We believe that kykeon was a mixture of several ingredients, including water, pennyroyal, and barley; the main ingredient was barley flour, which Hippocrates described as having nutritional (alimentary) properties. Hoffman, Wasson, and Ruck advanced the hypothesis that the Eleusinian state of ecstasy was provoked by alkaloids found in the ergot fungus, including lysergamides and lysergic acid hydroxyethylamide, which contaminated the grains of barley.¹⁶

Ethnobotany

The ergot fungus (*Claviceps purpurea*), parasitises cereals, gramineae, knotgrass (*Paspalum distichum*) and darnel (*Lolium temulentum*) in the Mediterranean region. The fungus reproduces in the spring; in dry summer weather, mycelia form dry black sclerotia that are able to survive winter temperatures.²

Ergot (a *Claviceps sclerotium*) contains a wide variety of pharmacologically active substances, including more than 40 ergot alkaloids. The most psychoactive alkaloids are hydrosoluble, while the most toxic, such as ergotamine or ergotoxin, are not. Isolysergic acid derivatives are pharmacologically inactive, but they may isomerise in an aqueous solution and achieve equilibrium with active derivatives of lysergic acid. Ergot alkaloids from lysergic acids are categorised as amides (ergometrine), peptidic derivatives (ergotamine), or clavines.

The entheogenic chemicals in ergot are water-soluble, unlike the toxic chemicals. An initiate could therefore see his first visions after ingesting an infusion of cereals contaminated by ergot.¹⁷ It is believed that Eleusinian priests gathered ergot from cereals and paspalum grasses growing near the temple, ground it, and added it to the kykeon.

Archaeological evidence

There is evidence supporting the hypothesis that ergot could have caused the Eleusinian visions. The purple colour of the fungus is associated with Demeter. Furthermore, the ear of grain was the symbol of the Eleusinian Mysteries. An example of Greek pottery from the 5th century BCE shows Demeter and Triptolemus holding a sheaf of grain infected with ergot. Traces of *C. purpurea* have also been found on the interior of a vessel in a sacred shrine dedicated to Persephone.

5. Other psychotropic plants

In addition to poppies, hemp, and ergot, the ancient Greeks burned mandrake and henbane as incense, and infusions of hemp and myrrh in retsina wine were used to add sparkle to social gatherings. Classical authors such as Dioscorides describe various formulas involving wine and mandrake, belladonna, African rue, or black hellebore.

The narcotic effects of *Mandragora officinalis* were reported by Theophrastus and Aristotle. Prior to that, it had been used in Assyria, as shown by cuneiform tablets found in the library of the palace at Nineveh, and also as an anaesthetic in Egypt, as shown by a bas-relief from the reign of Amenhotep III.

Henbane (*Hyoscyamus Niger*) is mentioned in the Ebers papyrus, and it was also used by Assyrian and Babylonian priests as a powerful hallucinogen. In Greece, treatises written by Xenophon and Dioscorides refer to its intoxicating properties. Datura (*Datura stramonium*) and belladonna (*Atropa belladonna*) were both used in Mesopotamia and Classical Greece.¹⁸

In a passage from the Odyssey, Homer mentions Circe's famous potion and credits it with the power to change Ulysses' companions into pigs; Ulysses was not affected, thanks to an antidote provided by Hermes. Some authors venture that datura, a substance able to overcome the will and facilitate hypnosis, could have been the key ingredient in this potion. The Greeks had a good knowledge of the effects and dosing of different datura species. For example, Theophrastus provides the following information for *Datura metel*:

'Of this three twentieths of an ounce in weight is given, if he is to go mad outright and have delusions; thrice the dose if he is to be permanently insane...four times the dose is given, if the man is to be killed.'²⁰

Apollonian and Dionysian rites

At times, psychoactive plants were used as part of more elaborate rituals. For example, in Apollo's Temple at Delphi, on the slopes of Mount Parnassus, the Oracle or Pythia delivered prophesies and oracular statements on future events that would have repercussions on social and political life in Ancient Greece. These predictions seem to have been made when the Oracle was in a trancelike state.

She would prepare by sitting before the chasm or crack from which intoxicating vapours arose, chewing bay leaves, inhaling smoke from a variety of plants, and drinking water from a specific source, after which she would prophesy in an ecstatic trance state.⁵ Plutarch also described the effects of a substance, stating:

the body [of the Pythia]...acquires a temper that seductively brings on sleep...it [the substance relaxes and loosens the chain-like sorrows and tensions of daily cares...it polishes and purifies like a mirror the faculty which is imaginative and receptive to dreams.²¹

Plato and Aristotle describe delirium in a Pythia, and the Stoics point to a state of near rapture called *enthousiasmos*.

Although there is a lack of evidence as to whether or not the Oracle of Delphi consumed some sort of psychotropic substance, some authors have suggested that she chewed bay leaves or a preparation containing opium and datura. Another hypothesis revolves around the inhalation of intoxicating nitrous oxide vapours emanating from a nearby geological fault.

Dionysus, the god of grape harvests and wine, was essentially Apollo's polar opposite. Worship of Dionysus was characterised by the ecstasy with which people expressed their feelings with the help of wine and dancing. Religious rites dedicated to Dionysus were celebrated every two years on Mount Parnassus. Women called maenads participated in the rituals, during which they would enter a religious trance under the intoxicating effect of the wine.

It is said that the maenads ran up to the summit of Mount Parnassus bearing in their hands lit torches and a thyrsus, or rod adorned with grape and ivy leaves. At the summit, they would dance wildly to the sound of the aulos until dropping exhausted to the ground. Mystical

intoxication was therefore achieved in this case through wine and dancing. Euripides described wine as follows: "there is no other pharmakon against troubles and to bring sleep; poured as a libation to the gods, it is a god itself".

Conclusions

The peoples of Ancient Greece continued the cultural traditions of the Iron Age and the Bronze Age in their use of sacred plants with hallucinogenic properties. Classical texts, archaeobotanical remains, findings in incense burners, and ritual artefacts all provide evidence of such use. In the Archaic period in Greece, poppies, cannabis, and other plants such as henbane or datura were used for ritual and medicinal purposes.

Conflicts of interest

The author has no conflicts of interest to declare.

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