Aegyptus et Pannonia VIII.

Acta Symposii anno 2021

BUDAPEST

Aegyptus et Pannonia VIII.

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Editor: Hedvig Győry

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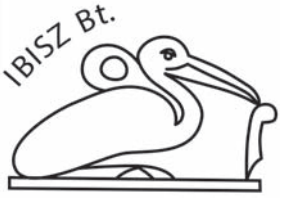

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and the HEFS AEC
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“Plants for Health from Ancient Egypt to Present Day” Conference and the HEFS AEC

Dr. Hedvig Győry PhD
HEFT AEC president

After the realization of the 2019 mummy conference, the need arose to discuss the new trends, methodologies and achievements in ancient materia medica from a phytotherapeutic point of view and to disseminate the results achieved by our in-depth research. With this conference, we also wanted to explore how many different ways there are to approach ancient plants and medicine, also from historical, cultural, religious, ethnographic and pharmacological points of view, and to compare it with other related fields. We also wanted to draw attention to other areas of research into plants that maintain and improve health. In this way, contemporary and historical treatments were juxtaposed, Egyptian, Hittite, Greek, Roman and later European herbal medicine, to mention only the most important regions studied in these proceedings. The conference was held in two languages, English and Hungarian, but all the articles in the proceedings are English. We hope that this way we can bring these issues to the attention of as many people as possible.

This time we have chosen to discuss the plants used for health problems. A significant proportion of the substances in ancient Egyptian prescriptions are of plant origin. Reviewing and studying their effects and data can also provide new opportunities for the current pharmacopoeia. Our group of doctors thought that there was a lot of new knowledge to be gained in this area worldwide, and that the knowledge of plants is becoming increasingly important, if we only think of the research into pathogens, many of which have adapted to synthetic drugs. We need thus new materials to use to eliminate them, and earlier medical practices may lead to the discovery of new active substances that are important for people today. Knowledge of these active ingredients makes it possible to apply these drugs as new medicines in a consistent quantity and quality. On the other hand, there are also many places where conditions do not allow the use of drugs produced by modern technology, but nature can help patients with its often hidden treasures. In addition to pharmacological research, folk remedies studied by ethnomedicine

and historical medical research play an essential role in getting to know them.

The HEFS AEC partly organizes its activities in cooperation with other organizations – the above-mentioned international workshop of the Nephthys project in 2022 was co-organized by the Hungarian Natural History Museum, while this very conference took place in partnership with the HNM Semmelweis Museum of Medical History, whose members gave several lectures on historical medicine and modern ethnomedicine, and where a special chamber exhibition would have welcomed the participants in honour of the conference, if the COVID had not prevented the organization of a face-to-face meeting. Nevertheless, we were able to offer the possibility of discussions and consultations in special virtual chambers, allowing the exchange of professional experiences.

The HEFS AEC has published these new proceedings, this time in two volumes (Aegyptus et Pannonia VII-VIII), containing more than half of the papers presented at the conference: “Plants for Health from Ancient Egypt to Present Day”. As we focused on our main research topic in the Medical Research Group of the HEFC Ancient Egyptian Committee, we wondered what the scientific community thought about the ancient Egyptian use of plants in various fields of human and natural sciences, the continuity of related knowledge, and the implications and possibilities of these ancient practices for people today. We also wanted to present the ideas we had developed and the results we had achieved in the professional field, and to provide an opportunity for specialists to discuss different topics. In terms of the structure of the proceedings, we have returned to the previous method of the series, so that the articles are once again listed in alphabetical order of authors, rather than by subjects

The HEFS Ancient Egyptian Committee and the medical history

The HEFS, which has been operating since 1995, carries out several activities in the tradition of its earlier activities: the general programs focus on the last five thousand years, selecting interesting and important topics, while the work of the AEC is mainly directed in three directions. An important objective is (1) the cultural transmission and dissemination of knowledge about ancient Egyptian culture through lectures and public meetings for interested adults, also in the framework of the Hungexpo. We also organise (2) artistic and handicraft activities, workshops accompanied by discussions on various topics with children, launching every year a fine arts competition (drawing/painting), the results of which will be exhibited for the third time in January 2023 in the Deák 17 Children’s and Youth Art Gallery of the Budapest History Museum; and (3) following scientific and scholarly research into the use of ancient objects, human and animal remains – including an international event of the Nephthys Project in 2022 – and medical history, concentrated on phytotherapy and surgery.

As far as our material at the conference is concerned, we present here as a starting point our research focused primarily on the use of plants in surgery, if only because several members of the group are doctors from the Department of Surgical Research and Techniques at the Faculty of Medicine in Semmelweis University, Budapest. The first scientific results of this new direction are published of today's surgical tools and materials. Thus our conference papers focus on the ancient Egyptian surgery from the point of view of the application of plants in these volumes, but research is alsobeing carried out in other areas. Firstly we present research in the direction that is mainly focused on comparative analysis, directed towards the ancestors surgical kit, the plant materials used for wound care and the general knowledge of ancient Egyptian surgeons, with a view to the surgical culture of other peoples and periods or the use of pharmacognostic knowledge. We have also considered it essential to investigate into possible reasons for the use of plants, which may allow us to consider modern phytotherapeutic applications.

Two other areas of our phytotherapy research are also represented in these volumes. The origin and treatment of various diseases throughout the world, and especially in ancient Egypt, is also an interesting topic. In this direction, we have chosen to focus one disease in particular. Diabetes is one of the most widespread diseases of our time, and we have chosen to study its ancient treatment methods. In this case, as in the case of surgery, we have compared several cultures to find out the ancient knowledge and problem-solving methods, and have pointed out herbs that are officially used in the world, or in Hungary.

Another problem of our time, seemingly far removed from the history of medicine, is the conservation and preservation of biodiversity, which is affected not only by climate change and other natural factors, but also by human activity. This phenomenon can be traced back even to ancient Egypt, although the process has accelerated in the last hundred years. One of our topics in this respect is presented here, showing how an ancient curiosity herb has become a plant of large-scale production in the 21st century, and saving this way the species from extinction.

A new direction of the group is the study of the history of Hungarian phytotherapy in partnership with the Semmelweis Museum for Medical History. We have just taken the first steps in this direction, but we can already say that the classical Roman authors, and the ancient Egyptian knowledge they transmitted also played an important role in official medical practice and influenced folk medicine in our country. It seems that the herbaria published in Hungarian language played a key role in this process.

The interweaving of contemporary and historical issues characterizes many of the articles in the volumes. At the same time, mutual influences, shifts of emphasis and reinterpretations within the ancient world, or elements of later historical periods that reach into the past or present, play a prominent role. In this field, it is essential to collect and examine the sources from a new perspective in order to obtain a clearer picture of certain details of the past. Historical, artistic, literary, religious, economic, museological, pharmaceutical, phytotherapeutic, ethnobotanical or even chemical points of view appear in individual articles. It has been proven that the ingredients listed in many of the ancient Egyptian recipes studied so far can still be used as effective medicines today.

This volume contains 16 contributions on the role of drug use in different periods. There are chapters on the reconstruction of some ancient Egyptian remedies, on the ancient method prescribed for the preparation of antjw ointment, or on the preparation and action of kyphi, and pelargonium, traced through biochemical and experimental research; Others are devoted to the materia medica used in Hungary over the centuries, or to the comparison of contemporary Egyptian folk medicine and pharaonic materia medica in the field of gynaecology; another is devoted to studies on the possible identification of magical Egyptian plant names with a dominant connection to the moon, or to the ritual and non-ritual use of some plant substances with religious names in Egypt. Others relate to the popular treatment of diseases such as tuberculosis and cholera in Hungary, or which edible plants have been identified in Coptic medical therapies. Sedative plants are also featured in the current volume, and a plant closely associated with a butterfly is discussed. Another article focuses on the pomegranate, with its many meanings as a symbol of fertility and female power. Yet another focuses on the worldwide surgical use of plants, while others discuss the balance between practical and religious beliefs in the use of medicinal plants. The pop-up exhibition for the conference is briefly introduced, hinting at the museological aspect of medical history.

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The editors of these volumes would like to thank again all the organizations and individuals who made the conference and the publication of these volumes possible, as well as the speakers, the members of the Organizing and Scientific Committees, the secretary of the conference, and the technical assistance, i.e. all those who contributed to the realization of the conference and who have contributed with their knowledge to the these volumes. Special thanks are also due to the authors of the papers for their work and cooperation.

We would also like to express our gratitude to all those colleagues and volunteers who have shared their expertise and offered their generosity by providing scientific or linguistic proofreading for these volumes.

Thanks are also due to the active participation of Aquila Design, who coordinated and realized the editing and printing and to our financial supporters, the Hungarian Natural History Museum, the Ibisz Bt. and the Kiss Ferenc a Növényi Biodiverzitásért Alapitvány [Kiss Ferenc Plant Biodiversity Foundation], whose aim is to raise awareness of the natural treasures we have and to try to teach people to use them, rather than abuse them.

https://doi.org/10.71067/AePVIII-2022-259-297

Some Sedative Plants in Ancient Egypt: Egyptian Blue Lotus, Hemp, Mandrake & Opium Poppy[1]

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Abstract

Egyptologists confirms the use of various narcotics ranging from practical daily use (mood elevation) to religious application (incense offered to the gods), as well as widespread medical use in the treatment of various ailments.

Ancient Egyptian physicians were undoubtedly aware of the fact that Egyptian blue lotus, hemp, mandrake, poppy, datura, Egyptian henbane[2] & belladonna were painkillers. There is no unequivocal evidence that they knew the chemical effects of the narcotics in each plant and the differences between their constituents, but they certainly knew how and when to use them, and experience taught them the almost perfect doses needed as medicine away from their harmful poisonous effect.

Keywords: sedative plants, blue lotus, hemp, mandrake, poppy

Introduction

Archaeological evidence of human use of drugs such as blue lotus, hemp, opium and "magic mushrooms" dates back as far as 10,000 years.[3] Ancient Egypt is known for its rich documentation of, among other things,

1 This article is an update to my book: *Sedative plants in ancient Egypt.* Beau-Bassin: Scholars' Press 2020, incorporating new results.

2 Pendants, which might represent the Egyptian henbane flowers are published from the Amarna period in: Győry 2002, 154, 156-157.

3 Russo 2007; Samorini 2019.

various events of daily life, religious beliefs, and there is abundant evidence of the use of various types of sedative (narcotic) plants, such as the Egyptian blue lotus, which is already mentioned in the Pyramid Texts, or depicted on wall paintings showing Egyptian individuals inhaling its scent and giving it as offerings to their gods. Also traces of hemp are said to have been found in the tomb of Akhenaten,[4] and juglets in the shape of poppy capsule, or mandrake have been found painted on the floor or walls of palaces and tombs.

It is clear that the ancient Egyptians had natural clues, experience and spontaneous knowledge of how to use plants to control pain. They listed many medicinal drugs and their plant sources in their manuscripts. Some of the sedative plants found and used in ancient Egypt are presented here: blue lotus, hemp, mandrake & poppy.

Egyptian Blue Lotus (*Nymphaea caerulea* Sav.)

Nymphaea caerulea is known commonly by the names Blue lotus, sacred blue lily, Egyptian blue lotus, Blue water lily & Egyptian blue water lily (Figure 1a), and belongs to the *Nymphaeaceae* family.

It is a diurnal aquatic plant; thus, the flower opens during the day. It grows in still or slow water, having a condensed underwater stem, and apical meristem that grows close to the substrate. It is characterized by efficient wide tracts of aerenchyma that helps keeping its stems, leaves, petals and flowers floating on the water surface, due to their high intercellular air content (Figure 1b). It is also characterized by obtuse-dentate leaves and blue pointed petals. *Nymphaea caerulea* has a flower with four sepals marked with dark purple lines and dots. Its petals are numerous and oblong to round (Figure 1c), its shoots emerge from the rhizome and grow up to the water surface.

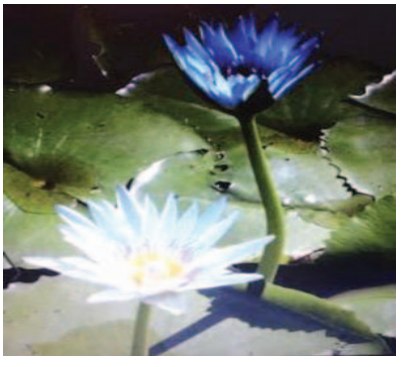
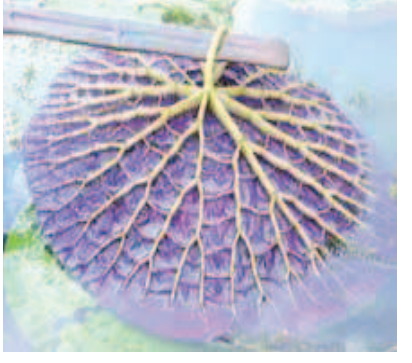


Figure 1a. Nymphaea caerulea flower



1b. Underwater condensed shoot with wide tracts of aerenchyma

4 https://en.wikipedia.org/?title=Talk:Seshat

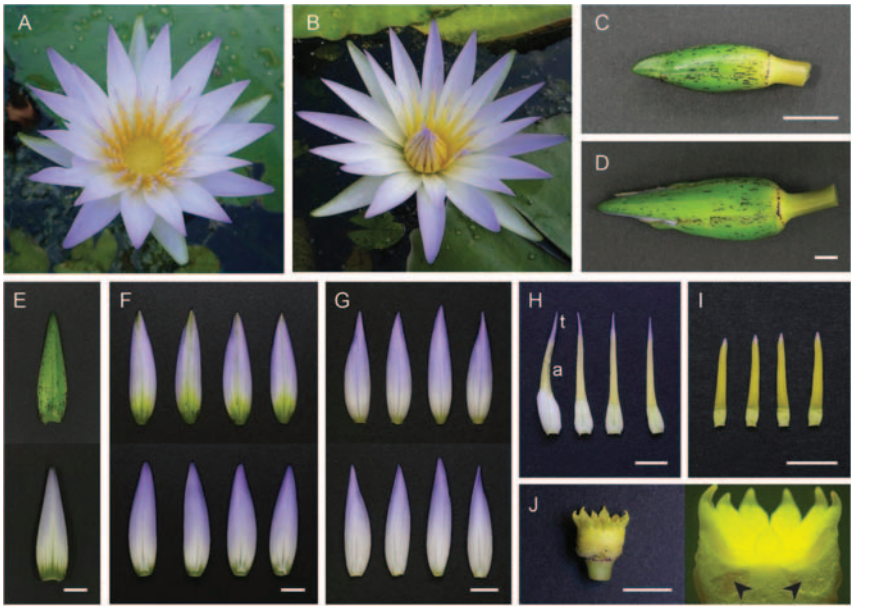
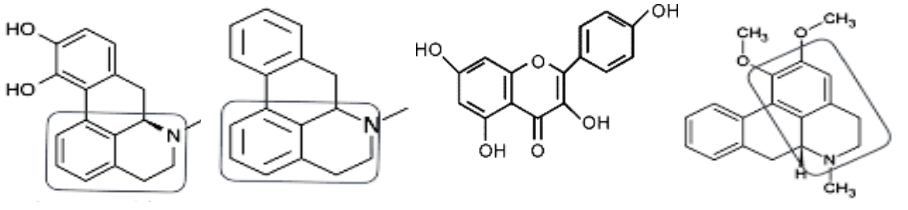


Figure 1c. **"***Nymphaea caerulea* floral components. **(A)** Flower at first day of anthesis; **(B)** flower at second day of anthesis. **(C)** A total of 2.5 cm long floral bud; **(D)** 5.5 cm long floral bud. **(E)** Green abaxial surface (top) and whitish adaxial surface (bottom) of a sepal. **(F)** Abaxial surface (top) and adaxial surface (bottom) of outer petals. **(G)** Abaxial surface (top) and adaxial surface (bottom) of inner petals. **(H)** Petaloid stamens, "t" indicates the cerulean tip and "a" indicates the anther portion. **(I)** Inner stamens. **(J)** Pluricarpellate pistil. Arrowheads indicate ovules within carpels. Scale bar, 1 cm." (Moschin et alii 2021, fig. 1.)

The growth of *Nympaea caerulea,* like that of other water lilies grown in Egypt, such as *Nymphaea lotus L.* (or *alba*) and *Nelumbo nucifera (Nymphaea nelumbo L.)*, requires shallow water, no more then three metres deep, and a muddy bottom. This explains its abundance in main channel of the Nile and in the swamps of ancient Egypt. The ancient Egyptians may have recognised the phenomenon of the self-cleaning ability of the lotus plant, the "lotus effect", also called as the "honey spoon lotus effect", long before its mechanism was explained in the early 1970s (In fact, the Indian pink lotus leaves exhibited a peculiarity: water washed away dirt particles from their surface. The reason was found to be their ultra-hydrophobic property: Water forms droplets on the surface of the leaves because of the leaves' special micro- and nanoscopic architecture, which minimizes the water adhesion. This self-cleaning property can be observed in some other plants and even on the wings of some insects.)[5]

5 Lafuma – Quéré 2003; Darmanin – Guittard 2015.

In practice, blue lotus have been found to produce a mild sense of euphoria and tranquillity, with a slightly altered state of consciousness. It is mildly sedative, nervine, mildly analgesic, relaxing and calming, and acts as an aphrodisiac. The psychoactive constituents of the *Nymphaeaceae* family, particularly blue lotus, are alkaloids, such as aporphine, apomorphine, nuciferine, nupharine, nupharidine and kaempferol (Figure 2).[6]



Apomorphine Aporphine Kaempherol Nuciferine

Figure 2. Chemical formula and names of some psychoactive ingredients found in Blue lotus.

Lotus in ancient Egypt

The ancient Egyptians used only one word to refer to both white and blue kinds of lotus flowers. The pure white and blue lotus flowers were both called *sšn/šsn* (Zeshen / Seshen or Shezen / Shesen) (Figure 3).

Figure 3. *sšn* / *šsn*, Seshen / Zeshen or Shesen / Shezen

Remains of both lotuses have been discovered in differnt ancient Egyptian periods at different sites,[7] from the earliest times. For example, from the late Paleolithic period at Wadi El-Kubbaniya site in Upper Egypt,[8] or from the early Holocene at Nabta playa site in the Western Egyptian desert.[9] Pollen samples of *Nymphaea caerulea* have also been discovered from the Predynastic Naqada period[10].

6 Bourgeois 1874, 61; Pinder et alii 1971, 995-996; Emboden 1989.

7 Vartavan et alii 2010, 168.

8 Hillman 1989.

9 Hather 1995.

10 A synthesis for this period see e.g. Smith 1960, 17-21.

The lotus, especially the blue variety, was considered a metaphor of creation in ancient Egypt, as it grows from the mud at the bottom of watery marshes, lifting its flower over surface of the water at sunrise, and unfolding its petals toward the sun, thus repeating each day the act of creation, that took place when the Sun god emerged from the *nun*, i.e. the primeval water.

The blue lotus had a deep significance to the ancient Egyptians, as evidenced by its use as a symbol of rebirth and resurrection in the religious level. In fact, they saw in its blossoms the rebirth and regeneration of life, because the flower opens in the morning and closes at night, just like the sun rises and sets. This parallelism was a fundamental principle in the ancient Egyptian religion, and the reason for the association of the blue lotus flowers with the great Sun God Ra (Figure 4a-c). Depictions of the sun in the form of the god Nefertem emerging from a lotus flower are common. As a result, Nefertem is usually crowned with the lotus flower (Figure 4d). Also, the many titles of the Egyptian goddess Isis, include the titles "*the lady of the lotus"* and *"Lotus-bearing*".[11]

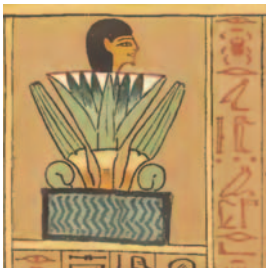


Figure 4a. Ra emerging from the lotus in the Book of the Dead papyrus of Ani (British Museum, EA10470. – Budge 1894, pl. 28. 4b. The dead person behind Osiris grows out of the lotus emblem of Nefertem, in the papyrus of the Chantress of Amon, Nisti-ta-Nebet-Taui (21th Dynasty), scene 4, with chapter 81 of the Book of the Dead: "*The Transformation into a Lotus*". Egyptian Museum, Cairo. The inscription in the frame reads: "*I am the pure lotus, going out as Ra*." (*jnk sšn wꜥb, pr m Rꜥ*) For further details, see Piankoff 1957, 93.

11 Lesko 1999.

4c. Iuput II as Horus emerging from a lotus. National Museum of Scotland, 23rd Dynasty
4d. Nefertem, God of healing and beauty, tomb of Horemheb, KV57.

The ancient Egyptians also believed that the sweet scent of the lotus flowers indicates the presence of their various sacred gods,[12] which is probably why many tomb include the scene where the deceased is depicted holding a lotus flower up to his nose and inhaling the sacred divine scent. (Figure 5b-c)

Figure 5a. Nofertari with sistrum and lotus at Abu Simbel, small temple. 5b. Nakht and his wife (Taui) sniffing water lily. TT52 (Seidel – Shedid 1991) 5c. Priest Nebseni sniffing blue lotus, TT 108. (Source: Wikipedia / Nymphaea Caerulea https://de.wikipedia.org/wiki/Nymphaea_caerulea, accessed 12.12.2022)

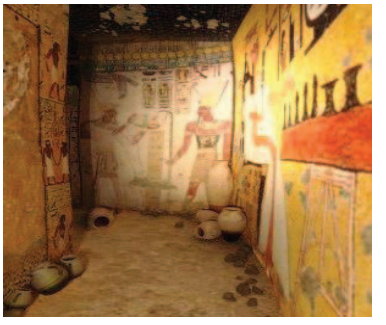
12 Savigny 1800, 124-129.

Again, it is important to refer to the mythology of the birth of the four sons of Horus, the protectors of specific parts of the mummified body. They are often depicted emerging from a blue lotus flower in front of the god Osiris (Figure 6).

Figure 6. Sons of Horus emerging from a blue lotus in front of Osiris. Book of the Dead papyrus of Hunefer (British Museum, EA9901, Taylor 2010, fig. 9.)

Remains of lotus flowers have been found at several sites in Egypt, the most important of which are probably those found in the burial sites and tombs of Ramesses II (Figure 7a) and scattered over Tutankhamen's mummy when Howard Carter opened the tomb a hundred years ago. He found white lotus in the floral collar placed in his 2nd coffin, blue lotus in his 3rd coffin (Figure 7b), while both blue and white lotuses were incorporated into the floral wreath of Anubis, whose statue Howard Carter discovered in the treasury.[13]

Many different scenes and depictions of the lotus flower can be found in different places and on different objects from different periods of ancient Egyptian history. Also depictions of the deceased on the walls of many ancient Egyptian tombs show them smelling lotus blossoms and sniffing their aroma to embrace the regenerative power of the sun. Examples of such depictions include for instance the 12th Dynasty stela of Ity (British Museum, EA586), which depicts two standing ladies, each holding a blue lotus flower in her right hand and sniffing it (Figure 8a). Mereruka's wife is depicted



7a

7b

Figure 7a. Model of the tomb of Ramesses II (KV7) by Ludmilla photo at https://www.turbosquid.com/3d-models/tomb-ii-ramses-3d-1160571 (accessed 12.12.2022)
7b: Tutankhamen's 3rd coffin, detail with the vegetal collars (Hepper 2009, 10, right side picture, Griffith Institute/Oxford)

13 Hepper 2009, 10; Herselman 2013.

on a stela standing with a lotus flower in her right hand and smelling it (Figure 8b). A scene from Nakht's tomb at Luxor shows banquet guests with a lotus flower (Figure 8c).

Figure 8a. Ity sniffing lotus flower, Dynasty 12. (British Museum A586, online collection, accessed 12.12.2022). 8b. Mereruka's wife, Watetkhet-Hor in his mastaba, Saqqara, Dynasty 6. (Mereruka 1938, pl. 28.) 8c. Snifting lotus at the banquet, tomb of Nakht, painted by Norman de Garis Davies, Lancelot Crane and Hugh R. Hopgood after wall painting in TT52 between 1908-1914. Metropolitan Museum 15.5.19d (online collection, accessed 12.12.2022), j-k. (Wilkinson 1979, 46–47, fig. 52.)

The blue lotus had a variety of uses and meanings in addition its previously mentioned and explained symbolism, cultural and religious signification. Among these uses are: food, namely its roots and other parts of the plant are edible – the same is true for the white lotus. It is mentioned that the ancient Egyptians used it to make a sort of bread by grinding the dried seeds of lotus plant into powder, similar to flour, as is attested by Herodotos (II.92) and Diodoros Siculos (I. 34.5-6). The flower was also used as a decorative material where various bouquets were made with different floral arrangements with other flowers for various ceremonies and offerings. It was also used to decorate the hair and to spread its sweet and intense fragrance.

It is also important and worth mentioning that blue lotus oil, together with other essential oils, perfumes, herbs and spices was used during the mummification process to reduce the odor of decomposition,[14] and was used for perfume production in ancient Egypt. Ancient Egyptians were pioneers in the natural perfume industry and mastered perfume making from various flowers, spices and herbs, typically mixing different essences.[15]

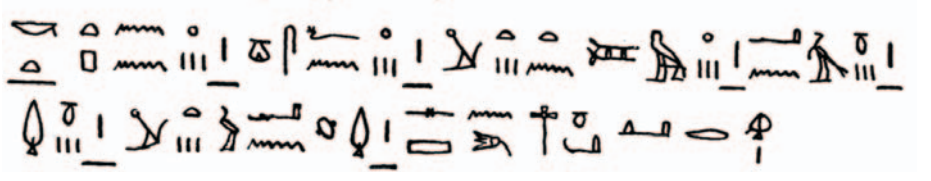
14 Toller – Todd 1992, 290.

15 See e.g. the stela of perfume making in the Louvre, reg. no. E11162, latest in Warburton 2008,

Blue Lotus in Ancient Egyptian Medicine

Lotus leaves were among the ingredients used for the treatment of various ailments and pain relief during the successive ancient Egyptian periods, such as liver diseases, constipation, as an ingredient for enema, poultice for the head, but also as a preparation to make a hated woman's hair fall out (Eb475).[16]

Interestingly, the lotus flower is mentioned in the medical texts published by Deines – Grapow only once, in Eb258, all the other applications of the lotus are the leaf, either in the term *ḫ3w* (*n sšn*), which is written with the leaf-stalk-rhizome ensemble, or with the *s3p.t*, which is written independently, without the name of the flower, and classified by the only drawing of the lotus leaf.[17] Eb258 treated the head:



"Another: cumin 1, resin-gum of asa foetida balm (gsfn) 1, fruits of tntm (powder) 1, antjw-resin [myrrh] 1, behen-oil (b3ḳ) 1, juniper berries (pr.t wʿn) 1, lotus blossom (sšn) [1], ground; applied to the head."

Prescription number 82 in Hearst papyrus, to remove fluid accumulations from the body and heart, consists of a mixture of herbal medicines including this lotus leaf, mixed with water used for oral administration and has the same ingredients as Eb224, excluded the tiger nut (*wʿḥ*). It is interpreted as follows: "*Another remedy: Grounded tiger nut 5; ḥmw-part of ricine(?) (k3k3)*[18] *1/8; ḫs*[*3*] *part of sycamore 1/8; fresh dates 1/8; leaves of lotus flowers 1/8; fresh mash (3ḥ) 10; water 20; strained; drink immediately."*

The pEbers recipe no. 209 applies the *ḫ3w*-leaf, and refers to remedies for the relief of right-sided abdominal pain, most probably liver or jaundice respectively. The ingredients listed contain lotus, which is to be "*soaked in wine and beer for a whole night*". In our modern scientific explanation, this is a way of extracting alkaloids in the lotus leaves, which are the substances resulting in pain relief.

221, fig. 1. See also for examples in this volume the lectures of Vadas, Sridi and Maravellia et alii.

16 For further details see the lecture of Petrovics et alii in this volume.

17 Deines – Grapow 1959, 465. All hieroglyphic texts are taken from Grapow 1958, if other source is not given.

18 Germer 2008, 132-134 doubts this identification.

"Another one to treat an obstruction in the right (belly-)half that has been crossed [*ḏ3.n* – Deines – Westendorf 1961, 64: "*has been attacked"*] *by a nesit demon: šnft 20 ro; white sḫt-grain 1/8; green sḫt grain 1/8; sd.w-part of bryony (ḫ3sy.t) 1/16; juniper berries (wꜥn) 1/16; parsley (mountain celery, m3t.t ḫ3s.t) 1/8; Lower Egyptian celery (m3t.t mḥw.t) 1/8; leaves (ḫ3w) of lotus 1/8; ꜥntjw-resin* [myrrh] *1/16; ḥt-ds-tree 1/8; malachite (w3ḏw) of boat 1/8; pine-oil (sft) 1/16; twn-plant 1/8; honey 1/32; beer 5 ro; goose-fat (mrḥt n s.t-goose) 1/8; left overnight in the dew; strained; drunk on four days."*[19]

The other word for the lotus leaf, *s3p.t* occurs for instance in prescription no 158 in Hearst papyrus which is used to cause baldness (*wš šnj*); the ash of the lotus leaf in oil is to be applied topically and is similar to prescription no. 475 in Ebers papyrus. H158 follows as *"Another: Lotus leaf; burnt to ash, added to oil / fat (mrḥ.t); applied to the head."*[20] Papyrus Ebers 475 adds at the end "*of the hated woman*"*(msdd.t)"* (i.e to put onto her head). This leaf is also used against skin alteration (H108) and the negative influence of the dead (Eb216).

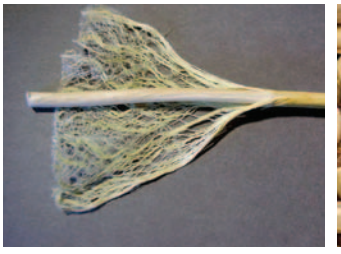
Hemp *(Cannabis sativa)*

Cannabis, popularly known as hemp – the raw material for hashish or marijuana – is a genus in the flowering plant-family *Cannabaceae*. It has three main species: *Cannabis sativa, C. Indica* and C. *ruderalis*. It is a dioecious plant, meaning that individual plants can be male or female (Figure 9). Hemp has been used for the production of fibres, hemp oils, medicinal substances, and also as a recreational drug.

19 Translation based on Paul Ghalioungui 1987, 86 (Eb258), 72 (Eb209).

20 The papyrus was first published by Reisner 1905.

Figure 9 a-c. *Cannabis* plants,



9d. hemp stalk with fibres

9e. hemp seeds

9f. Male hemp

9g. Female hemp

9h. Male & female *hemp*

9i. Modern hemp rope (Photo from the Wikipedia, title Hemp and Encyclopedia Britannica online version, accessed 12.12.2022)

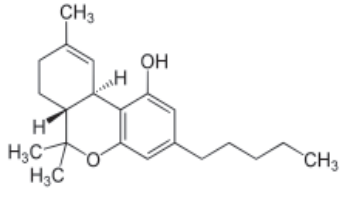


Figure10. Chemical formula of tetrahydrocannabinol (THC)

The psychoactive constituents of the *Cannabis* plant are the terpeno-phenolic compounds called cannabinoids. The main sedative component of the hemp used as a drug is a lipid called tetrahydrocannabinol (THC). This is just one of over 500 known compounds found in the plant,[21] including at least 65 other cannabinoids. The female plant produces the best quality of cannabinoids, which are found in the buds (flowers) of the plant, which contain the highest concentration of THC, followed by the leaves. The stalks and seeds have much lower levels of THC (Figure 10).

Hemp in ancient Egypt

Hemp has a long history as both a medicine and a recreational drug.[22] Although there is very little evidence that ancient

21 See UCLA Center for Cannabis and Cannabinoids at https://cannabis.semel.ucla.edu/compunds/ (accessed 12.12.2022).

22 Croc 2020; Freitas 2022.

Egyptians cultivated hemp, moreover, it is theorized that it was spread to East Africa via Egypt.[23] There are several references and indications of its availability in ancient Egypt, as well as its multiple uses.[24]

The plant itself is rarely attested among the plant remains,[25] suggesting that it could not have been a common plant. However, the distribution of finds spans the entire ancient Egyptian history. The earliest appears to be the prehistoric find mentioned by Guy Brunton.[26] He says – referring to 12 September, 1930 – that during the excavations "I have been examining the Roman things from Mostagedda; many of them have parts of the designs in the tapestry weaving outlined in white thread. This thread is also used for the embroidery on sleeves, etc. I took it to be flax, but could not understand why so many of the lines had perished, or were very imperfect. Flax is of such resisting nature. On comparing it under the microscope with fibres from other sources, it is certain that the yarn is made from hemp. This of course accounts for the rotting of the lines. Hemp is the type A fibre which is found in the Badarian, Predynastic, and Pan-grave cloths, and I find it in the Dynastic fabrics from these Badarian sites also. It is very puzzling." Hemp is also reported as pollen in Naqada.[27]

After a long period, a hemp fibre ball is mentioned in the Kahun town of the 12th Dynasty,[28] as well as pollen from the Eastern Delta, probably from the same period.[29] The next date belongs to the New Kingdom: during the investigations on the mummy of Ramses II, the pollen analysis also revealed *Cannabis*.[30] Lisa Manniche mentions that in the Amarna tomb of Akhenaton hemp pollen was discovered during the new investigations.[31] The Late period again provided some material, as during the macroscopic examination of the coffin of Di-Her-iaout, the restorers found hemp fiber,[32] while in the internal organs of another mummy radio immunoassay systems and gas chromatography/mass spectrometry detected THC together with other drugs.[33] This raises the possibility that hemp smoke was inhaled during a ritual

23 Warf 2014.

24 Russo et alii 2008; Skoglund et alii, 2013; Tata 1986, 41; Barber 1991, 15; Murphy 2011, 2579.

25 Vartavan et alii 2010, 64-65 lists only a few occurrences, see in the following.

26 Brunton 1937, 145. – Although Vogelsang-Eastwood 2000, 269 claimes that no hemp fibres are known from ancient Egypt.

27 Emery-Barbier 1990, 324. (KH3).

28 Now in Berlin, Botanisches Museum, No. 159. See Udelgar Körber-Grohne 1992, 249.

29 Leroy 1992, 49 (Core S7a).

30 Leroi-Gourhan 1985.

31 Manniche 1989, 82.

32 Vozil 1980, 20.

33 Parsche – Nerlich 1995. See also Nerlich – Parsche 1994.

ceremony.[34] Not surprisingly, Ptolemaic hemp pollen was again discovered during a mummy examination in the Lyon Museum.[35] The mummy is dated to about 100 BC.

Because of the strength of hemp rope, it is assumed that hemp fibres were used in the construction of the pyramids. It could be used to pull heavy limestone blocks to the pyramid building site. It was also suitable for splitting and breaking rocks and stones. The method could involve hammering, pilling and pushing the dry fibres into cracks made in the rocks or stones, and then periodically watering the rope to make it swell in the rock. As a result of this process, the rope would crack the split, which would become larger and larger.[36]

It is also important to note the ancient Egyptian Goddess Seshat (*S3t*) depicted as a woman wearing a cheetah or panther skin draped over her robe with a headdress (Figure 11) of a "star surmounted by a bow" or "conventionalized flower(?) surmounted by horns" (Gardiner sign list R20, R21) or hemp leaf,[37] arched by a crescent in the form of a horn or bow, or the number 10 or rope. Indeed, she was considered the goddess of the written word, temple libraries and texts, sacred buildings, architecture, astronomy, astrology and mathematics.

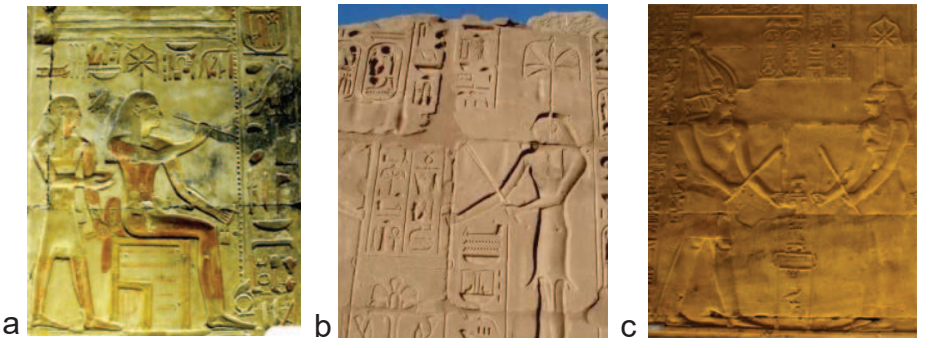


Figure 11a. Seshat in Medinet Habu writing the years of Ramses III. 11b. Relief of Seshat in the Karnak temple with the measuring tools. 11c. Seshat in the Edfu temple during the „*streching the cord ceremony*" (Getty images).

34 Because of the presence of nicotine and cocaine the risk of containation is, however, high.

35 Girard – Maley 1987, 107.

36 About fracture mechanics in ancient Egypt see El-Sehily 2016 and for stone extracting in general see Bloxam 2010. The technique is described, but rope are not mentioned.

37 H. Peter Aleff 1982/2008 – *Seshat in Luxor* (facebook by Seshat, at https://www.facebook.com/profile.php?id=100081436221439) and *Seshat und ihre Werkzeuge* (also at „*Journey to the Goddess*" homepage, Seshat, https://journeyingtothegoddess.wordpress.com/2012/05/30/goddess-seshat/, accessed 12.12.2022) – I could not find the articles refered to there.

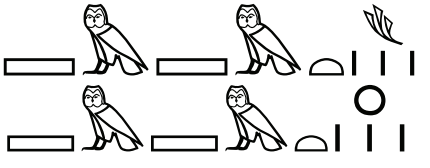
11d. Headdress of Seshat represented on the Red chapel of Hatshepsut and the thron of Ramses II in Karnak

11e. Typical *Cannabis sativa* leaf (vm homepage, accessed 12.12.2022)

Figure 11f Seshat in the Karnak temple with headress of 5-units sign

11g Typical *Cannabis ruderalis* leaf (weedbates homepage, accessed 12.12.2022)

ANCIENT EGYPTIAN POSSIBLE NAME FOR HEMP



or

Figure12. Different ways of writing *šmšm.t* with hieroglyphs (DEINES – GRAPOW 1959, 493)

Warren R. Dawson identified the ancient Egyptian *šmšm.t* (Figure 12), with the hemp[38] on the basis of Pyramid Text 319, §514a as follows: "It is tempting to identify the plant with the Arabic *šemšem*, *sesame*, but the two

38 DAWSON 1934, 44-45, followed by CHARPENTIER §1114 and NUNN 156, although it is not accepted by all Egyptologists. WESTENDORF 1999, 507 gives this meaning only with question mark. LORET 1892, 57, no. 91 identified *šmšm.t* with sesam, and GERMER 2008, 132-133 rejects both identifications.

can scarcely be identical, for sesame is constantly used for internal doses, whereas the Egyptian *šmšm.t* never is. The word occurs in the Pyramid Texts (§ 514) with an elaborate determinative, and is spoken of as a plant from which ropes are made, which makes the equivalence with hemp *Cannabis sativa*, much more likely. Hemp (*qinnib*) is stated by the Arabic medical writers to be unfit for internal use. The Pyramid spell referred to is: "…(513d.) *N. makes the lapis lazuli grow; N. causes the Upper Egyptian twn-plant to sprout*. (514a). *N. has tied the cords of the šmšm.t-plant*. (514b.) N*. has united the heavens; N. rules over the lands, the southern and the northern* …",[39] where N stands for Unas. The drawing of the above mentioned plant suggests a herbaceous plant because of the image behind the word, which shows – instead of the schematic plant determinative – a slightly bending stem with branching foliage at the top. Since neither of the usual plant determinative is visible again in the the word for the *twn*-plant, menioned above, the engraver of this text clearly wanted to reproduce the characteristic shape of the actual plants (See Figure 13).

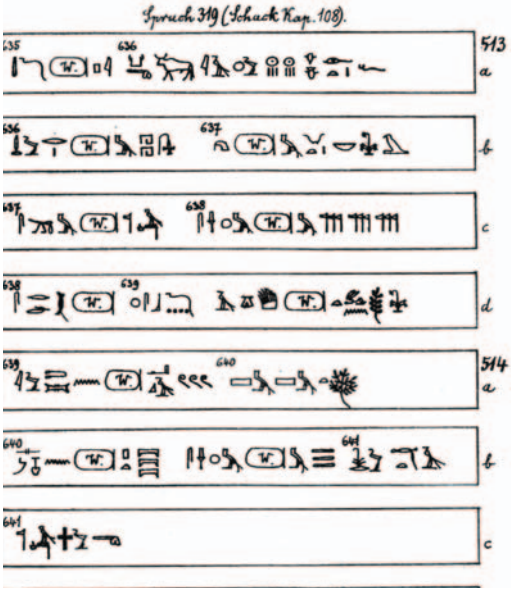


Figure 13a. The picture of the Pyramid Text on which Dawson may have based his identification. (Sethe 1908, 63).

13b. Photo of the word *šmšm.t* with the determinative (Piankoff 1968, pl. 2.) 13c. Photo of the *twn*-plant (Piankoff 1968, pl. 2.).

However, in Hannig's Old Kingdom dictionary, another plant is mentioned in connection with its meaning, as he identified it with *Niederliegender Krähenfuss* / *Coronopus sqamatus* (Forssk.) Asch. (called also *Lepidium co-*

39 Translation by Mercer

ronopus, swinecress) on the basis of the same text.[40] In his Middle Kingdom dictionary, he gives the same meaning and refers only to a medical Ramesseum papyrus (Ram III. A26). Thus, according to our present knowledge, *šmšm.t* seems to be mentioned very rarely in texts and even then only in a few medical texts, except for the Pyramid text mentioned above.

The šmšm.t in ancient Egyptian Medicine

The *šmšm.t* was prepared as part of a remedy for the treatment and cure of certain ailments, to alleviate and relieve pain causing discomfort and suffering, rather than as a basic treatment. Dawson[41] lists it for fever (Bln 81), where its roots are used, and the choice of the herb is clearly due to its name being a play on "*fever*"; for irrigation of the rectum (Bt 13b (juice), Bt 24 (crushed seeds); for the sore toenail (Eb 618; H 177 and H 188) and for uterine contractions (Eb 821). It is also known from the pharaonic period for an eye disease (Ram III. A26), against the influence of deceased persons or a god (Brl 59) and for a woman suffering from *bꜥ*-breast disease (Mutter und Kind, H).

I present some examples of prescriptions that include the *šmšm.t* as a medical ingredient:

Number A26 of the Ramesseum III Papyrus (Figure 14a-b),[42] contains a prescription in which *šmšm.t* is mentioned to be used in the treatment and cure of the above-mentioned eye disease (*sḳḳb mw jr.tj* "*to cool the water of both eyes*") by being used as component of an eyewash. The text mentioning this medicine and its method of preparation and use is as follows:

"*Another remedy: celery (mȝt.t), hemp (šmšm.t) are ground and left in the dew overnight, both eyes of the patient are to be washed with it in the morning*."

Both the Hearst (H 177, (12,6-7), H 188 (12,15-16)) and the Ebers Papyrus (Eb 618 (78,10-11)), contain the same medical prescription that includes hemp used on the toenail, or according to the H 177, also on fingernail. In the papyrus Ebers there follows a prescription entitled: "*If you find a painful*

40 He refers to Faulkner 1969, 101; Piankoff 1968, pl. 2; Spiegel 1971, 337 and Porter – Moss 1978-1979, 421 (5,9) – all deals with the same Pyramidtext.

41 Dawson 1934, 44.

42 Published by James E. Quibell 1898, 3 for the discovery; and Gardiner 1955, 9 and 17; pl.7-10, 63-4 for the hieratic texts.

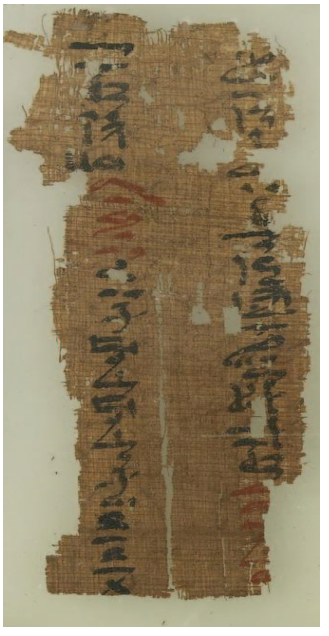
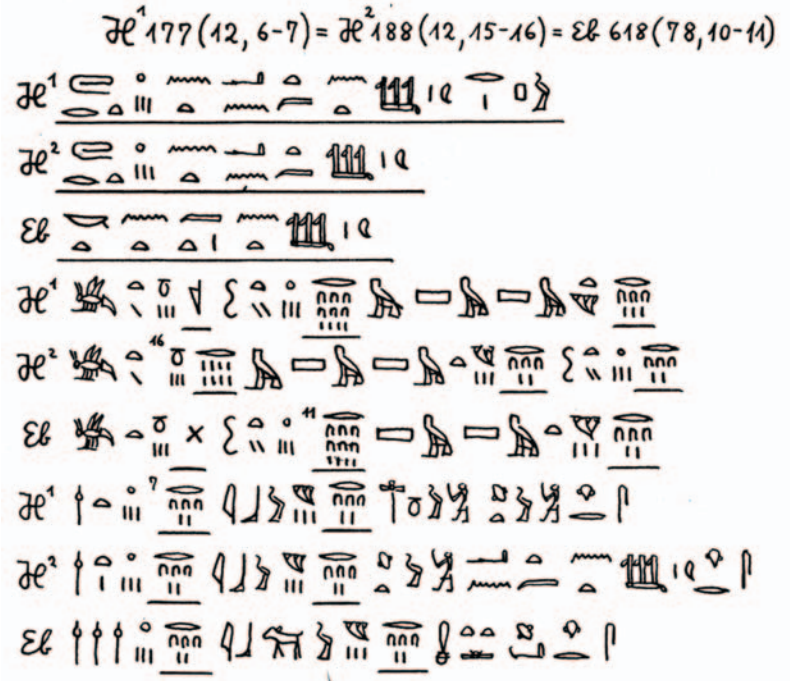


Figure 14a-b. Fragments of the Ramesseum Papyrus, Plate A26 of Ramesseum III. and the refered part, British Museum, EA10756/3 (online catalogue, accessed 12.12.2022)

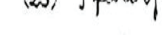
finger or toe, from water having been around them (serosity), its odor is malignant, while they have formed maggots [worms]" (Eb 617), so it probably treated the same case, especially as Eb 618 ends with the sentence: "*the same way, and dress with it.*" The same way probably refers to the way of preparation, as Paul Ghalioungui suggested.[43]

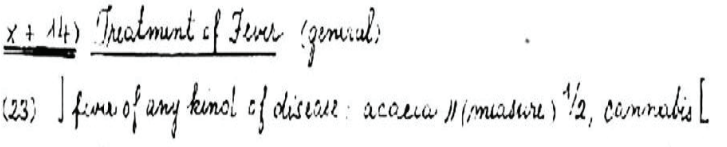


43 Ghalioungui 1987, 162-163.

H177: *"Remedy for a toenail or [finger nail]: honey 5 ro, ocker (stj) 1/64, šmšm.t (hemp) 1/33 [miswritten instead of 1/32], ḥḏt-resin(?) 1/32, jbw-plant 1/32, ground, bandaged therewith."*

The Chester-Beatty VI medical papyrus (1300 BC, British Museum EA 10686), known to be the oldest treatise dealing with anorectal diseases, mentions *šmšm.t* with medical purpose in at least two formulae used as after-treatment for colorectal diseases or pain: the rectal casting in Bt 13b (sheets 6,6-8) is said to contain the juice, while in Bt 24 (sheets 7,8-9) the crushed seeds were used.

Cannabis is also among the remedies in the Demotic Crocodilopolis Medical Book (P. Vienna 6257), which was written down in Roman times. Unfortunately it is very fragmentary, but even so it is clear that it follows classical formulas.[44] It uses a different word for *Cannabis*, however, the *mšy*, written as  . As *materia medica,* 7 cases are collected in its publication under the title Pharm 76 (p. 264): against the *ryty*-tumour, to paralyse the tumour, against infections(?), pain in the ear and for the treatment of fever, e.g. see below.



x + 14) Treatment of Fever (general)

(23) [fever of any kind of disease: acacia // (measure) 1/2, cannabis [

x — 14. Treatment of Fever

(23) *g'šm* is the transliteration of the Greek word κνίδμα. cf. *LLM*, vso. 33, 4, 6, 7, 8; *kks: Pharm.*, no. 184, and *P. méd. C.*, 322: acacia was used for the cure of any kind of illness: *šny*; cf. *above*, p. 155 (36).

mšy: Pharm., no. 76.

Treatment of fever using medical *Cannabis* (Reymond 1976,123 and 191, column XIV), also at http://antiquecannabisbook.com/chap2B/Egypt/Vienna.htm (accessed 12.12.2022)

Although hemp is not mentioned in the Egyptian book of Herodotus, who lived in the middle of the 5th century BC, the use of *Cannabis* as a recreational hallucinogen is explained in connection with the royal Scythes in a later book of his historical writings (IV, 74-75). This description is probably the earliest mention of hemp as a drug. Dioscorides in his *Materia medica* (c.40-90 AD), mentions two different species of *Cannabis*, one for ear, which is medicated with herbs, and to quench conception by its seeds (III.165),

44 Reymond 1976.

while the other species is applied after boiling the root to cure inflammations, oedemas and „*hardened matter around the joints*" (III.166).[45]

Diodorus Siculus (1st c. AD), a Sicilian Greek historian, mentioned, that Egyptian women used the *nepenthes* (1.97.7) as a kind of medicine. It is said that "*they say, a drug to cure anger and sorrow, was discovered exclusively among the women of Diospolis; but Thebes and Diospolis, they add, are the same city*".[46] Its other ancient occurrences are also related to the suppression of grief with forgetfulness, which is why it is assumed to be prepared from plants such as poppy or hemp.[47]

Mandrake (*Mandragora officinarum*)

Mandragora, popularly known as mandrake or alraune (Figure 15), is a short herbaceous perennial plant, whose leaves grow in a basal rosette on the ground. It is known for its large fleshy root with bizarre or anthropomorphic shapes and its rosette-shaped leave-system. The leaves vary in size and shape, with a maximum length of 45 cm. It belongs to the night shade family (*Solanaceae*), with five species in the genus (*Mandragora caulescens C.B.Clarke*/ Himalaya, *Mandragora officinarum L. 1753* + *Mandragora autumnalis Bertol.* / Mediterranean, *Mandragora turcomanica Mizgir* / Turkmenistan and Iran and at last *Mandragora chinghaiensis* /Central Asia). One or two species are known to grow in abundance around the northern and eastern part of the Mediterranean and these are the mandrakes cultivated in ancient Egyptian gardens during the New Kingdom.

Mandragora officinarum, or common mandrake is famous for its root, which can grow up to 1 meter long (39"). Its flowers are bell-shaped and vary in colour between white, yellow, green, purple and violet. Its fruit is berry-shaped and turns yellow or orange as it ripens. It has a fruity odor with a tomato flavor and its leaves smell like fresh tobacco (Figure 15A & B). Mandrake fruits are commonly known by various names such as "*Satan's apple*" fruits, or *Adam's head* etc.[48] They are also called "*love apple*" as it was believed to have a sexual effect and increase fertility.[49]

45 Dioscorides, trans. Osbaldeston 2000, 534-535.

46 Translation by Charles Henry Oldfather in Loeb Classical Library 1933. Digitalized at https://topostext.org/work/133, in Greek: https://www.perseus.tufts.edu/hopper/text?doc=Diod.+1.97&fromdoc=Perseus%3Atext%3A2008.01.0540. The νηπενθές / *nēpenthés* is made up from *ne*–, „*not*" + *penthos*, „*grief*" in Greek. (Links accessed 12.12.2022)

47 See e.g. Greydanus et alii 2015.

48 For the many other names see Dafni et alii 2021.

49 Quarra – Kaplish 2022.

Figure 15. Mandrake plant, flowers, fruits and seeds.

There are several hypotesis about the origin of the Latin and Greek name "*mandragora*" / μανδραγόρας. One of them derives it from two Sanskrit words: "*mandros*" which means "*sleep*" and "*agora*" which means "*substance*". When the two words are combined, the meaning is "*sleeping substance*". There are other hypotheses of Sanskrit origin, such as *"mand"="joy*, *intoxication"*, or *"mantasana"*="*sleep* or *life*," or *"mandra"*="*pleasure*", or *"mantara"*="*paradise tree*" + *"aryu"*="*unmarried, violently passionate*", but other languages are also included into the possible etymologies.[50]

Mandrake is known for its medicinal, aphrodisiac, hallucinogenic, and poisonous properties; virtually all parts of the plants contain active alkaloids. In particular, the root contains 0.3- 4.0% tropane-based alkaloids, such as atropine, hyoscyamine (daturine), and scopolamine (hyoscine) (Figure 16); it is important to note that the presence of tropane alkaloids is the reason why the root and leaves are poisonous and they cause the anticholinergic, hallucinogenic and hypnotic effects.[51]

50 For Greek and Persian (Farsi) see latest Dafni et alii 2021, 5. Lise Manniche 1989, 119 says that it appears to be derived from the Sumerian NAM-TAR ("*plague god plant*"). Wetzstein [226: 441] relates it to the farsi [*medumgia*] = "*the plant man*." p.14, and he also gives other possible explanations.

51 E.g. Hanus et alii 2005.

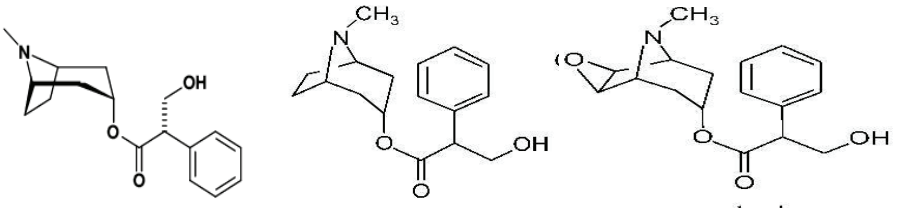


Figure16. Alkaloids found in mandrake plant: atropine, hyoscyamine, and scopolamine

Mandrake in ancient Egypt

Mandrake, native in Eastern Mediterranean, was introduced to Egypt from Palestine during the Eighteenth Dynasty and became a domestic plant in the New Kingdom (1551–1305 BC).[52] The fruit was collected.[53] During the early Roman imperial period it seems to have been a typically Egyptian plant, as Dioscorides (IV.76) mentions a specific Egyptian name for it: *apemum*.[54]

Although there are no specific mandrake finds from ancient Egypt,[55] representations on walls, floors and objects show, that mandrake had a special importance in ancient Egypt. It was considered one of the most famous plants. Its berries were associated with the concepts of love and desire, which was probably promoted by the preparation of a potion made from it – this is well attested in Graeco-Roman period.[56] Mandrake was also used to strengthen sexual power, and as an implication or connotation for male potency, as shown in love poems, such as "*her breasts are mandrake fruits*" (pHarris 500,1,11) or even with an ancient explanation: "*Just when she brings her … the mandrake fruit …Then it would be in my hand while she smells. In other words, she would offer to me the hue of all her body*." (Cairo Vase o. CGC 25218 + o. DM 1266,18-19).[57] The yellow fruits are mentioned in New Kingdom love songs with the word *rrm.t*, and are often associated with *sšn*-lotus flowers (*Nymphaea caerulea*).[58]

It was sacred and dedicated to the goddess Hathor.[59] The ancient

52 Keimer 1924, 172.

53 Germer 2008, 294 mentions a box with Carter's number 540.

54 Translation in Osbaldeston 2000, 624, 627-628.

55 Vartavan et alii 2010, 157 lists only the *wsḫ*-collar of Tutankhamun, but its half fruits identified earlier as mandrake are doubted by Germer 1989, 11 and Hepper 1990, 15, who suggests the *Mimusops* fruit.

56 E.g. Theophrastos, IX, 8,8 at Manniche 1989, 119.

57 Manzano 2005, 31.

58 E.g. Derchain 1970 and Derchain 1975.

59 E.g. Mutter und Kind papyrus (pBerlin3027): *m ḥ3.w ḥr mnḏ.t=f, rrm pw n(.j)* 3,10 *ḥw.t-ḥr.w* / „*Befalle*

Egyptians believed that mandrake possessed a divine power derived from its close relationship with the gods.

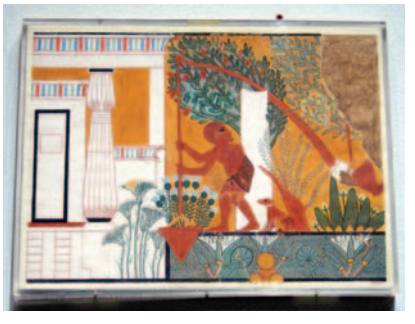


Figure 17a. Depictions of women giving and receiving mandrake fruits, Tomb of Nakht, Thebes (Davies 1917, pl. XV.)
17b. Detail of the banquet in the tomb of Nebamun, Thebes (British Museum, EA37984, online collection, accessed 12.12.2022)
17c. Garden scene with mandrake at right, in the tomb of Ipwy, Deir el-Medine (copy made by Norman de Garis Davies in 1924. Metropolitan Museum, 30.4.115, online collection, accessed 12.12.2022)

Figure 18a. Mandrake fruits and lotus petals in a faience necklace from Tell el-Amarna (British Museum, EA59334, online collection, accessed 12.12.2022)
18b. Faience mandrake amulet from the palace of Amenhotep III, in Malqata (Metropolitan Museum, 11.215.231, online collection, accessed 12.12.2022)

nicht seine Wangen, sie sind Hathors Mandragoras!“ (Thesaurus Linguae Aegyptiae: https://aaew.bbaw.de/tla/servlet/GetWcnRefs?f=0&l=0&of=0&ll=95400&db=0&lr=0&mo=1&wt=y&bc=Start)

It is important to mention that mandrake played an important role in the ancient Egyptian myth of the destruction of humanity and the creation of the heaven, as described in "The Book of the Heavenly Cow"[60], inscribed on the walls of the tombs of kings Seti I, Ramesses II, Ramesses III, Ramesses VI, and first discovered on the outermost gilded shrine of Tutankhamun (Figure 19).

Figure 19: Scene from the Book of the Heavenly Cow, Tomb of Seti I (KV17) and Outermost gilded shrine of Tutankhamun (KV62), Cairo.

Its magical power is reflected even in the way it is said to have been collected. According to Josephus Flavius (Jewish War VII.3), it was gathered only on certain nights, by moonlight, or with the morning dew; the picker plugged his ears with wax, tied the plant to a dog, and ran away; the dog running after its master, uprooted it and then fell down dead, for the mandrake, when torn away, was said to utter such a terrible cry that anyone who heard it or touched it went mad or died on the spot.[61]

Mandrake in ancient Egyptian Medicine

The word *rrm.t* is not known from pharaonic medical texts, although the plant may have been used in medicine because of the strong drugs it contained. On the contrary, in a New Kingdom iatromagical text it was certainly used for snakebite, because of its magical properties.[62] However, it may have had other uses, too. It is clear from the representations and poems, that it was a widely known plant whose fruit was widely consumed. With its introduction into Egypt, its possible uses were certainly also introduced. Much later, in Greek medicine, Hippocrates suggested that it can be given in small doses for the

60 See e.g. Lichtheim 1976, 197-199. To its literary setting see Spalinger 2000.

61 Source: Lecture given by Dr. Paul Ghalioungui, Egyptian Professor of Medicine and an endocrinologist, historian of Egyptian medicine.

62 pBM EA 9997 + 10309, pBM EA 9997, 1,10-3,12 (spell 2, line 3,8) See Leitz, 3-30, pl. 1-8: *ḥk3.w rrm.w[t] r=s, sm3 ///* … "*The magic of the mandrake is against it, to kill ///* [i.e. the disease demon)".

deepest depression,[63] and for wounds (*Fistulae* ch.11). Similar analgesic and mood-enhancing uses are very likely, especially, as we know from love poems about its aphrodisiac qualities. Although the ancient Egyptian depictions show only the smelling act, the fruit may have been eaten for this reason – it is the only low/non-toxic part.

In the demotic magical papyrus of London-Leiden, written in the Roman period, there is a prescription for using mandrake root to induce sleep, which translates as follows: "*when you wish to have a man sleep for two days: mandrake root [μανδρακορος ριζα], one ounce; licorice [?], one ounce; henbane [Hyoscyamus muticus], one ounce; ivy [Hedera helix], one ounce; you crush these together. . . . If you wish to do this skillfully, give to each part the four-fold amount of wine, you moisten everything from the morning until the evening, you shake it off, you have it drunk; very good."* (col. 24.6–14)[64]

Dioscorides (IV.76) suggested that its potion should be administered during amputations or cauterisations[65] – as we already know, it was indeed effective, due to its hypnotic and narcotic properties, but dangerous. Similarly, he gives several other uses in various preparations, including expulsion of phlegm and black bile, the alleviation of pain, the softening of suppositories, inflammations of the eyes and ulcers, the dissolution of all harnesses, abscesses, glandular tumours, the defacement of scars without ulceration, but he also warns that it can easily infatuate or cause death.

Opium poppy (*Papaver somniferum*)

Papaver somniferum is a plant commonly known as opium poppy or bread poppy; it is a species of flowering plant in the family *Papaveraceae*, which can be harvested and used to produce opium. *Papaver rhoeas*, a close relative, was an ornamental plant in New Kingdom Egypt, grown in gardens for its beautiful, bright red flowers (Figure 20).

Papaver somniferum is an annual herb, growing up to 150 cm (60 in), with a pale grey to bluish-green (glaucous or glabrous) appearance, flowering from July to August. It is a native to the eastern Mediterranean.[66] Its stem is slightly branched, bearing leaves that are large, numerous, ovate to oblong with unevenly toothed margins, bluish green to silver-green in colour. The seeds are derived. They are in a spherical capsule topped by a disc formed

63 Hippocrates 1995, 68-69, chapter 39 (translated by Paul Potter).

64 Griffith –Thompson 1921, 149-150.

65 „… *Some boil the roots in wine until a third remains, strain it, and put it in jars. They use a winecupful of it for those who cannot sleep, or are seriously injured, and whom they wish to anaesthetise to cut or cauterize*…" (4-76, translated by Osbaldeston 2000, 624).

66 For wild progenitor see Askitopoulou et alii 2002, 29.

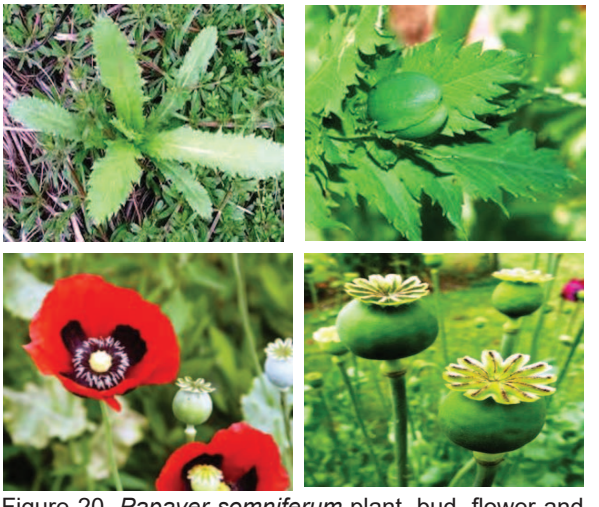


Figure 20. *Papaver somniferum* plant, bud, flower and capsule

Figure 21. Stages of *Papaver* seed formation.

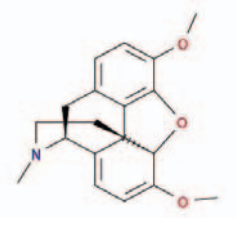
by the stigmas of the flower; the seeds emerge and fall from pores under the disk when the movement of the wind shakes the plant and its capsule.

The poppy seeds are tiny, about 1 mm [0.04 in] long, and non-narcotic because the fluid in the bud that converts into narcotic substance (opium) is present only before the seeds are fully formed. They are greyish blue to dark blue and kidney-shaped (Figure 21). Because of their nutty aroma and mild nutty taste, poppy seeds (bread seeds) are considered a type of food, and are used to flavour bakery products. They are also a source of oil (Figure 22).

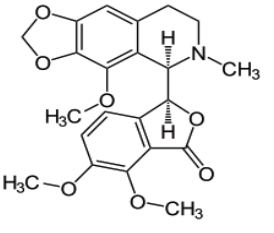
Opiates are derived from *Papaver somniferum* "opium poppy", and are extracted by scraping the unripe seed capsule and collecting the rubbery exudate, called *milky sap* or *latex*, and drying it. Raw opium contains psychoactive constituents, that belong to the phenanthrenes alkaloids class,

Figure 22. Opium poppy seeds (bread seed) used in pastries and for oil production.

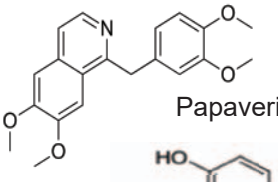
and those that have no effect on the central nervous system belong to the isoquinolines alkaloid class. The most active phenanthrene psychoactive compound in opium is morphine, named after Morpheus, the Greek god of dreams. It was first extracted from opium in pure form by Friedrich Sertürner in the early nineteenth century, in 1805.[67] Morphine is a very powerful painkiller, and is also highly addictive. Other psychoactive opiates include codeine, thebaine, noscapine, papaverine, oripavine (Figure 23).[68] It is important to note that approximately 12% of the opium latex is the analgesic alkaloid morphine, which is chemically processed into heroin and other synthetic opioids for medical use and the illicit drug trade. Opium also contains about 24 other alkaloids in the isoquinolines class, which have little or no psychoactive effect on the human central nervous system.



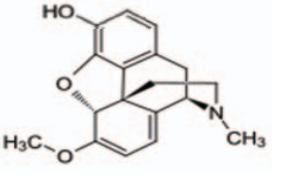
Thebaine



Noscapine



Papaverine



Oripavine

Figure 23. Alkaloids found in poppy plant

Papaver somniferum (opium poppy) in Ancient Egypt

The poppy(?) plant is written as *špn* with hieroglyphs and probably its seed as *špnn*:

Figure 24: Opium poppy and its seeds with hieroglyphs (*špn* twice then *špnn*)

The ancient Egyptians certainly harvested the plant's milky latex fluid during the Ptolemaic period, and used it to produce opium. The technique for extracting opium was probably the same, as it is today: the extraction process begins two weeks before the leaves of the plant fall off. At dusk, when the poppy seed capsule has hardened, small incisions are made to allow the sap to flow out. The next morning the brownish paste is removed and collected,

67 He published it the next year. Sertürner 1806.

68 Carlin et alii 2020.

made into leaves, dried and possibly ground into powder (Figure 25). However, there is evidence of opium as early as the New Kingdom: as Lise Manniche explains, the 18th Dynasty Kha took a vessel filled with a resinous substance into the Otherworld, which turned out to contain morphine.[69]

Ancient physicians prescribed it to treat pain, to kill pain, to relax the nerves and to help fall asleep. Opium was also used as a euphoric drug. Based on Dioscorides (4,64-67), the Alexandrian school researched it intensively, certainly continuing earlier traditions.[70] It seems to have been known at the latest from the beginning of the New Kingdom,[71] probably commercially imported from Cyprus in base ring jugs that were distributed all over the country during the 17th-18th Dynasties (1600-1450 BC).[72]

Figure 25. Poppy seed capsule incised, then gathered and brownish paste is removed

Opium may also have been mixed into the famous Egyptian incense-based compound, called "*kyphi*", which was used for religious & medical purposes.[73] It could also be considered as herbal drug: the so called "*anti-sorrow drug*" (*nepenthes*), which suppress sorrow with tranquility. The first mentions are known from Homer's poems in the Iliad (VIII, 306) and the Odyssey (IV. 1. 221), as an Egyptian potion.

The earliest evidence for the presence of *Papaver somniferum* in ancient Egypt[74] dates from the 18th Dynasty, around 1389 BC: opium poppy capsule was found in the tomb of the architect

69 Manniche 2006, 131-132. Although Bisset et alii 1996 doubt it.

70 Veiga 2016.

71 See e.g. Behn 1986 and Saunders 2003.

72 Gabra 1956, 39, 45 and 46; Merillees 1962; Kritikos – Papadaki 1967; Koschel 1996 attests the opium remains in the content of a Base Ring Ware I type I Ba(II) juglet in the Martin-von-Wagner-Museum of the University of Würzburg (Inv. no. A.39).

73 Veiga 2016.

74 For a general summary see e.g. Serpico – White 2000, 404-405.

Kha at Deir el-Medina (TT8, Figure 26a);[75] in Tell El Amarna and later sites, several earrings were found in the shape of the *Papaver somniferum* capsules, easily recognisable by the serrated top of the capsule (Figure 26b). The lower petals of the poppy have been found in funerary wreaths, such as that of the mummy of Princess Nesi-Khonsu (22nd Dynasty, found in Deir Al-Bahari (Figure 26c)[76].

There are also paintings with red poppies. A perfect mural can be seen in the tomb of Sennedjem, Deir el-Medine (TT1), below an orchard of date-palms, doum-palmes and figs. The poppies, along with mandrakes and cornflowers, are part of the fields of the Netherword. The petals were also used to make large bouqets or pendants, and were part of broad necklaces.

Figure 26a. Deir el-Medina workers tombs 26b. Queen Tauseret's ear ring in poppy shape with the cartouche of Sety II, from tomb KV56 (Cairo, Egyptian Museum) and 26c. Nesi-Khonsu's Mummy (Cairo, NMEC).

Figure 27a-b. Wall painting from the royal palace in Tell el-Amarna (Petrie 1894, pl. III.3 and pl. IV.5)

75 Bruyère 1937, 109 no.6, 201 no. 13.

76 Schweinfurth identified the petals as belonging to *Papaver rhoeas* (Vartavan et alii 2010, 175)

Figure 27c. Floral bouquet behind the deseased in the tomb of Djehutimes (Paroy, TT295), Photo at Osiris.net.
27d. Mutemwia wearing a balm cone decorated with poppy and lotus flowers in the tomb of Noferrenpet (Kenro, TT178), Photo at Osiris.net

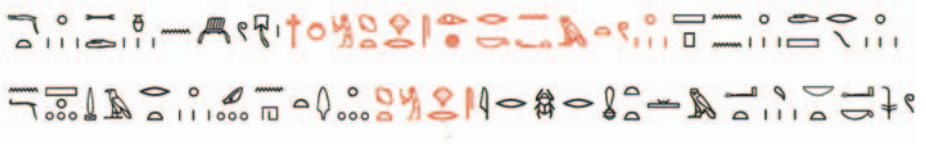
Opium poppy in Ancient Egyptian medicine

Poppy is mentioned in the Ebers Papyrus as *špn*, as one of the ingredients of some remedies prepared and used by ancient Egyptian physicians as a pain killer and in treatment of various ailments such as relieving respiratory problems, insomnia, headaches and anesthetics. It is usually in the form of *špnn*, which is derived from *špn* as Eb 782 prescription (see below) cleared it. It is probably an opium-based product made from the poppy. A typical use is related to the hair, as three prescriptions containing *špnn*, the Ebers 440, 443 and 445, are from the same book and are used as an ointment for hair-care. Ebers 782 (93,3-5) recommends this opium-based remedy for calming and soothing children who were shouting or crying too much:[77]

Remedy for driving out much-crying:
shepnen of shepen, flies' excrement, which is on the wall,
make into one thing, mash and eat for four days. It stops immediately[78]

77 Lang 2013, 170.
78 Nunn 1996, 153.

It could also be used for open wounds, as it is attested in two cases of the surgical Smith papyrus. The first occurance (Sm 41) is the following:



(6§) … *ir.ḫr.k nf tmtw spnn dšr*
(7§) *nšš ḏ3rt ḏrdw nht wt hr.s* ...
... You must prepare for him a powder of red poppy (extract), nšš-seeds, carob beans and pulverized sycamore leaves. Bind (along) with it….[79]

Conclusion

In conclusion, it is easy to confirm that the ancient Egyptians have chosen from their flora a variety of sedative plants.[80] They not only knew them, but also cultivated and used them in their daily lives and as ingredients in medicines. Sedative plants were prescribed as a kind of painkiller and sedative material and were used in prescriptions and remedies prepared for curing and treating some ailments as well as for relieving sadness, bad tempers and mood modifiers.

This proves and certifies that the ancient Egyptians built a great civilization which is still alive today and which has contributed and continues to contribute to the progress of our world in all areas of life, science and medicine. Many ancient Egyptian secrets have already been reveaed but there is still much to know, study and discover.

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79 Hieroglyphic text, transliteration and translation from Sanchez – Meltzer 2012, 253. Another occurence of *špnn* in the Smith papyrus is at page 278 (Sm 46); for earlier translations see Allen 2005, 99 (Sm 41) and 103 (Sm 46).

80 For present day flora see Boulos 1999-2002, also with reference to sedative plants (Boulos 1999, 152f and Boulos 2002, 48-50).

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