

Aegyptus et Pannonia VIII.



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Aegyptus et Pannonia VIII.

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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 also being 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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MEDICAL ACTIVITY IN ANCIENT EGYPT: EFFECTIVENESS AND MAGICAL ASPECT

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ABSTRACT

Egypt, as one of the most important cradles of ancient civilization, is known for its advanced medicine. Greek and Roman writers report on this in their works, while the original material came to light by the decipherment of the rediscovered Egyptian medical papyri, beginning with the last quarter of the 19th century. Nowadays, advanced technical devices aid healing, the development of which – we like to believe – can be attributed to the result of the technical development of the past 200 years. However, this is not entirely true, since in ancient times doctors knew many healing processes from practical experience, and we see from the ancient texts that certain knowledge of modern medicine was already known thousands of years ago, the roots of which can be traced back to ancient Egypt.

While studying ancient Egyptian medicine, rational and irrational approaches are conspicuous. Rationality is based on practice and observations during centuries, passed on orally and in writing; while irrationality is based on their approach to life: they would observe seemingly the same medical case treated the same way, resulting differently. They could only rely on their naked eye, which could see no reason. Invisible factors had thus interfered, which meant to them the divine world. To approach it meant religion, which also incorporated magic.

In the light of recent researches, these two points of view went hand-in-hand throughout the whole history of ancient Egypt. Sources for the Old Kingdom are scarce, but mythological anatomy and snake spells are well attested, and the grammar and the vocabulary of the Smith surgical papyrus (written down during the 18th Dynasty) show many features of this time. We also know that special medical books were used then. From the Middle Kingdom, again we have snake charms and other magical healing papyri, some of them found together with rational ones, such as the medical papyri in

the Ramesseum. From the New Kingdom more medical papyri survived, but also iatromagical or irrational/magical ones, and new genres were developed on both sides. The situation did not change later either; many iatromagical texts are known, but there are also traditional prescriptions, not to mention the Brooklyn ophiological papyrus, with the scientific description of the various types of snakes and accurate descriptions of the consequences of their bite, or other Brooklyn papyri, presented also at this conference.¹

In this article we try to answer what *materia medica* (in particular the use of plants in prescriptions, and their application) were used by ancient Egyptian healers of the New Kingdom, and how and why their effectiveness made them so famous. For this purpose, we investigate samples from both practical and magical points of view, and compare them, when possible, to modern scientific data. For this purpose, we use both references to the papyri, earlier and later literature, both from medical and phytomythological points of view, material remains and results of new scientific investigations. We have focused on the usage of plants. Besides presenting the results, we also cover some difficulties in the research.

KEYWORDS: ancient Egypt, medicine, iatromagia, henna, poppy, carob, tigernut, ricine, sycamore, date, lotus, prescription, anatomy, *metu*, *materia medica*

INTRODUCTION

We still enjoy the rich heritage of ancient Egypt. For many centuries, however, the only knowledge of Egypt's past in Europe were the pyramids, the Bible, and the sources in the literature of ancient Greece and Rome. Moreover, after the decline of the Roman Empire, this latter source material was forgotten. Thus, the Renaissance marked a turning point in rediscovering classical antiquity, and also ancient Egyptian culture, though through the eyes of the Classical world. However, it was only during the era of romanticism in Europe at the end of the 18th century that the ancient monuments of the country became a popular topic. During Napoleon's campaign in Egypt (1798-1801), Egyptology was first established on an institutional basis, and pharaonic architecture, history and geography was introduced to Europe.² Thanks to the fortuitous discovery of the trilingual Rosetta stone with both Greek, demotic and hieroglyphic inscriptions, the decipherment of Egyptian writings and languages at last became possible. (Thomas Young (1814) and Heinrich Karl Brugsch (1848) for demotic and Jean François Champollion (1822) for hieroglyphic writing).³ This decipherment increased even more the fascination

1 See the article of Juliane Unger in this volume with further literature.

2 DESCRIPTION DE L'ÉGYPTE 1908-1918.

3 For further details see BUCHWALD – JOSEFOWICZ 2020.

with Egypt. “The Magic Flute” of Mozart and Schikander, or the great works of Goethe and Schiller are all characterized by a fascination for Egypt.⁴ Egyptian and Egyptianizing works have appeared in large numbers ever since.

Thanks to its geographical situation, ancient Egypt is one of the lands where all the conditions for a flourishing civilization were available. In this, the role of the Nile – the “daughter of all people”,⁵ as a life-sustaining river was of enormous importance, as its natural role made it possible for people settled on its banks to carry on prosperous farming with the help of an advanced irrigation system. This was then a catalyst for the creation of the double kingdom, Upper and Lower Egypt, united under one ruler around 3000 BC. The ancient Egyptians were also aware of the inestimable value of the Nile, as the later ancient historians also mention it in their works. Herodotus (II,5) called Egypt the „*gift of the river*” Nile.⁶

The natural geography of the country not only determined the material side of the Egyptians' lives, but also had a decisive impact on their worldview. The cyclical, dual system, the flooding and ebbing of the Nile, the movement of the stars and planets also contributed to their concept of history that viewed events in a constant, renewing cycle. Relying on the principle of duality, the regularity of nature, and at the same time man's dependence on it, resulted in such a strong belief in Gods that it permeated people's everyday life, including medicine.⁷ And thanks to the many documents available of their writings, we are left with a medical body of knowledge that allows us to gain insight into ancient Egyptian medicine.

Many of the diseases in ancient Egypt were caused by environmental factors.⁸ Among the direct negative effects of sand blown by the wind, lung and respiratory diseases and dental problems arose, since the sand in the food also damaged teeth. Insects and parasites from the Nile river led to infections and even life-long diseases such as schistosomiasis⁹ or malaria among others. Trauma and many other health risks were also present. The work on the pyramids and other large-scale constructions – among others – may have resulted in the disease of silicosis among the workers, caused by the inhalation of the large amount of silicon dioxide-containing rock dust resulting from the quarrying of the stones.

4 BREZVAI 2021, 3.

5 KOSZO-STAMMBERGER 2021, 78 (Roos).

6 FARKAS 2014, 7; GRIFFITH 1966.

7 GYŐRY 2003b, 22-66.

8 GYŐRY 2002, 63-71.

9 GÓRAN 2005, 40-41; KATONA ET ALII 2015.

MEDICINE IN ANCIENT EGYPT

The ancient Egyptians usually attributed the cause of disease to gods. They believed that either the gods sent divine beings, now often called demons, who caused the disease, or they were struck by the great gods themselves as a punishment. People could also get sick because of the gods' inattention, for their god did not protect them, and keep the harmful beings away from them. This religious view was combined with practical experience, since the physical symptoms of the disease were perceived and were treated physically. The parallel presence of rational-practical and irrational-magical is well reflected in the simultaneous use of medical and healing magical papyri. An excellent example is the Smith papyrus with a completely rational surgical recto (with only one magical spell) and prescriptions and magical spells mixed on the verso.¹⁰ The Ebers papyrus contains mostly prescriptions, but we learn from the first three paragraphs, that for the administration of the remedies collected in the papyrus, special magical spells had to be said. From the Hearst papyrus (H214-216) we know that the *materia medica* in itself needed incantation in order for it to be used successfully for healing.

1. MATERIA MEDICA

Most of the extant papyri are fragmentary, and many of the words of the *materia medica* are unique or rare, not present in other types of texts, so only a few meanings or exact identifications of the plants, minerals and animal organs or secretions and human products are certain. Even so, the wealth of ancient Egyptian remedies transmitted by the medical papyri is extremely significant, and an important element of the recipes is the use of herbs or their parts.¹¹ Most of the medicinal substances could be stored – the dried raw materials used, and the remaining inscriptions on the vessels indicate this. Ancient Egyptian doctors collected many raw materials; others were brought from foreign lands. This is how myrrh (*ḥntjw*) and frankincense (*sntr*) entered the country and became an essential element of the Egyptian culture¹² – the gods liked them so much, that they needed them for most of the temple rites. Again others, such as fig (*d3b*), sycamore (*nh.t*), date (*bnr*), barley (*jt*), emmer (*bd.t*), garden lettuce (*ḥbw*) or cumin (*tpnn*)¹³ were native or introduced as domestic plants and were cultivated in Egypt. These are plants whose ancient names we also know.

10 For the latest publication for the recto see SANCHEZ – MELTZER 2012, for verso see BREASTED 1930.

11 NEMES 2008, 22.

12 GYÖRY 2011, 126.

13 GYÖRY 2011, 98.

In many cases, we can only read out the hieroglyphs, but have no idea which plant they mean. The situation is different with others, where some researchers identify the plant, but this identification may not be accepted unanimously, or is even rejected. Such a disputed case is, for example, the wild lettuce (*Lactuca sativa* or *L. serriola*), which seems to be the $\zeta\beta$, a translation which is, however, rejected by some scholars, while some others propose for the $\zeta\beta$ the *Melilotus officinalis*, although this plant is still not attested in Egypt.¹⁴ Similar uncertainty surrounded the henna plant (*Lawsonia inermis* L.).

HENNA

It is native to North Africa, but is attested in Egypt as a plant only from the Graeco-Roman period.¹⁵ The thorny shrub grows rapidly, and produces the best dye when the temperature reaches 35-45 °C.

In traditional Indian medicine, it has a wide range of uses, for cardiac disease, diabetes, diarrhoea, fever, headache, jaundice, obstinate skin affections and several others.¹⁶ Clinical investigations also attest its efficacy in many fields, with such properties as e.g. hypoglycaemic, hepatoprotective, immunostimulant, antiviral, antiparasitic and tuberculostatic character.¹⁷ The leaf of the henna is also fungicidal, hinders microbial growth and is beneficial for injured skin.¹⁸ The bark's methanolic extract is analgesic, anti-inflammatory, a source of carrageenan and a Central Nervous System (CNS) depressant.¹⁹

An outstanding usage in Arab and Indian culture is its skin-painting ability, based on its protein staining lawsone (C₁₀H₆O₃) content,²⁰ which is applied as henna-tattoo. It makes also a characteristic red nail- or hair-dye. Henna is said to have a cooling effect when a mass of crushed leaves is placed on the skin, and this might have led to its use as body-paint.

The many effects are explained by several medicinal agents, such as carbohydrates, proteins, flavonoids, tannins and phenolic compounds, alkaloids, terpenoids, quinones, coumarins, xanthenes and fatty acids being some main

14 LORET, Flore, 68, no. 113 – suggested the *Lactuca*. It was rejected by KEIMER, Gartenpflanzen, Bd. I., 126. DAWSON 1934, 41 suggested the melilote, which is followed by DEINES – GRAPOW 1959, 87 and, in the dictionary of HANNIG (2001, 150) this is given as translation. For the question see also GYÖRY 2007.

15 VARTAVAN ET ALII 2010, 143.

16 SENWAL ET ALII 2014; VEPACHEDU 2014, 3-4.

17 VEPACHEDU 2014, 6.

18 HARISHA ET ALII 2021.

19 NESA ET ALII 2014. Usefull also for injuries, e.g. REKIK ET ALII 2019.

20 This agent is activated when the dry leaves are crushed into powder and are in an acid environment. Being on the skin it migrates into the outer layer, and binds the proteins. As the skin peels off, it exfoliates. For its use in EU see SCCNFP/0583/02, final.

ingredients. Its core chemical components are 2-hydroxynaphthoquinone (lawsone), mannite, tannic acid, mucilage and gallic acid.²¹

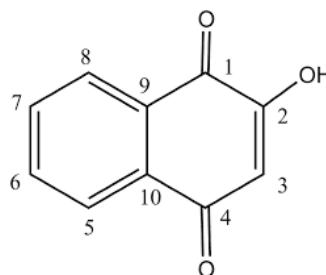


Figure 1. Henna (TRIVENI ET ALII 2016, fig.1) and the molecular structure of lawsone

Henna is rarely mentioned in the literature related to pharaonic Egypt. Based on mummy studies, the temporary henna tattoo²² seems not to have been known to the ancient Egyptians. The practice of stained hair and nails seems conceivable, though needs further clarification.²³ Ahmose-Henuttamehu is one individual who might have used it during the 17th Dynasty. Grafton Elliot-Smith found the surviving scanty locks at the sides of her head and on the occiput as „stained a brilliant reddish (henna?) colour” interpellated with strands of black hair. Connected to henna hair dye again the mummy of Ramses II is usually cited.²⁴ But attestations of the plant itself originate only

21 E.g. SENWAL ET ALII 2014, 80-103; VEPACHEDU 2014, 5; Dr. Duke's Phytochemical and Ethnobotanical Databases <https://phytochem.nal.usda.gov/phytochem/plants/show/1147?qlookup=Lawsonia+inermis&offset=0&max=20&et=>

22 – although permanent tattoos are well attested from the Nagada period with a variety of pigments. See e.g. BIANCHI 1989; POON – QUICKENDEN 2006; POON 2008; etc.

23 Some statues as early as the Old Kingdom had red nails, which might be the result of henna dying, see BORCHARDT 1897.

24 SMITH 1912, 19, pl. XIV, CG 6106 = MASPERO 1889, 543-544, coffin no. 10, nothing is said about the colour of the hair. About Ramses II (coffin 19.) he said „cheveux blancs au moment de la mort, ont été teints, en jaune claire, par les parfums” (MASPERO 1898, 562); also BALOUT – ROUBET 1985, 221 found that the original hair was red, which became white by age, and some of them were artificially turned yellow. The material which caused it, could not be identified. Ramses II was

from the Graeco-Roman period. Palaeobotanical studies evinced that it is an archaeophyte in South-Arabia, today's Israel, Jordan and Lebanon; thus, the Egyptian might have acclimated it at any time.²⁵

Many researchers take it for granted that ancient Egyptians knew and used the henna plant, and are looking for a match. Charpentier²⁶ identifies it with the *kwp̄r/kpr*-plant,²⁷ which is not mentioned in medical contexts, but known as a personal name from Nubia,²⁸ and was used in demotic.

Another suggestion of Charpentier is the *hnw* plant based on the consonance with the Arabic name (*hinna*).²⁹ This plant is known only from Eb774, where it is used with flax and „fly-dirt” (fly droppings) in a prescription against a disease called *nssk*. Although it is not known exactly what disease *nssk* is, the classifier knife and the root *nsk* („sting, bite”) point to a sort of scarred scalp. Eb772 mentions *m-h.t zf.t=f* „nachdem angeschnitten ist” – as Westendorf translates, or „angeritzt ist” as Grapow translates, based on *zff*'s meaning „to cut up; to slaughter”.³⁰ Thus some sort of wound appeared (in a given phase? of the disease), which might induce hair loss. From a spell against this disease (Eb776), it turns out, that it is specifically connected to the vertex of the head. It is usually interpreted as hair loss or baldness because in Eb466 the hair has to be allowed to regrow after its loss as a consequence of the *nssk*-disease.³¹ Thus the only known medical use of *hnw* plant is in hair growth or anti-hair loss agent. In the Brooklyn 47.218.84 mythological papyrus we meet this plant again: Geb suffering from burns caused by the uraeus snake, crosses a *hnw*-field, where he is healed after having put his headdress

identified as a curly red haired, light skinned person already by CECCALDI – ROUBET 1978, based on the high level of reddish pheomelanin and low level of dark eumelanin. Concerning the hands, however, Maspero wrote that they were stained red by henna. (MASPERO 1898, 562)

25 ARONSON ET ALII 2017.

26 CHARPENTIER 1981, 718, no. 1187.

27 So does also MEEKS 1977, 385, no. 77.4376; and MEEKS 1978, 387, no. 78.4263: *kwp̄r*, henné, cf. KUENTZ, *Biblia e Oriente* 2, 61-4.; VYICHL 1983, 84-85: ancient Egyptian name attested as plant in the Demotic as *kpr*. In onomastic see KUENTZ 1972.

28 RANKE 1935, 333, no. 29 = BLACKMAN 1911, 22, scene 1:d, 29: scene 4: d. etc. (the father of the deified *P3.dj.3s.t*) reign of Augustus.

29 CHARPENTIER 1981, 474, no. 763, see GERMER 2008, 96. GERMER 2008, 95 propose, that it might be an orthographic variation of *hnj*, which is interpreted by Kuhlman as *Cyperus alopecuroides* Rottb. – he refers to a notice of Keimer (KUHLMAN 1984, col. 287 and note 22), CAMINOS 1954, 74: *hn* or *mnḥ* ?)

30 WESTENDORF 1999, 142, DEINES ET ALII 1958, 142. Wb/TLA.

31 Similarly, Eb465 is for „letting the hair grown”; in this case the *j3s*-disease (baldness) made it necessary.

on his head.³² Interestingly, henna is advertised nowadays also to nourish and promote hair growth.³³

Eb 774 (92, 10-12)



Eb771: remedy of *nssk*-expeller: - 

Eb774: *k.t*: *mhy*, *hnw*, *snwh*, *htb hr mrh.t hn^c hs n^c ff*, *sjn m h.t w^c.t*, *rdj r=s*.

Another one: *flax*, *hnw-plant*, *boiled/burnt*, *dipped into oil/fat with fly's dirt*, *mix into one mass*, and put on it.

Another word translated by some scholars as henna is *nh-jmj*.³⁴ The name means „*life is in it*“, which points to a very effective life-giving plant. And indeed, we can often find this as a strongly scented plant in magical papyri, but very rarely in medical prescriptions:³⁵ in Br153 – against a *bsj*-tumour; in the Br1204 – lacking the beginning with the purpose;³⁶ and in the Brooklyn ophiological papyrus – against snake bite (Brk47d and Brk54h). And indeed, henna is used in folk medicine after snake bite and scorpion sting,³⁷ where it might be beneficial, as the latest investigations into henna have attested its efficacy for skin-inflammation, as also against some other types of skin conditions.³⁸ The *bsj/bnw*-tumour is still unidentified; it is typically a sort of

32 GOYON 1936, 16-17, 34. He translates *hnw* as henna, and in note 39 he gives the reason as being this in the name of the settlement, where the naos was used. It was called after this plant: Saft el-Henna, but he explains that this identification is uncertain. – Anyway, the healing was realised not by this plant but by the wig of Ra.

33 <https://www.femina.in/beauty/hair/benefits-of-henna-for-hair-health-55622.html>; <https://www.stylecraze.com/articles/henna-for-hair-growth/>; <https://www.curlcentric.com/henna/>; <https://pgshop.in/blog/12-amazing-benefits-of-henna-for-hair-growth-hair-health/> etc. (last accessed 12.12.2022)

34 GERMER 2008, 280-282.

35 GERMER 2008, 42-43.

36 It follows three ear-prescriptions, so it might relate to the ear, but it is also the closing prescription, written in another hand, and not using the red for the numbers, so it might relate to anything else. (WESTENDORF 1999, 410, note 661.)

37 FÉLIX-SILVA ET ALII 2017, 18 (India / bark)

38 REKIK ET ALII 2019.

growth of the belly.³⁹ The root *bs* means „to flow forth”, but also *bzj* „burn up” which might mean soft or blistered swelling, and as Br152 mentions, not just one specific sort of growth, because there are „every sort of *bnw*-tumours”.

Thus, from a pharmacological point of view both *hnw* and *nh-jmj* drugs tentatively identified with henna might have been correct, although the effects deduced from the prescriptions seem to be poor compared to henna’s abilities. However, neither *hnw* nor *nh-jmj* can be henna, as a newly found papyrus in the Louvre gives detailed descriptions of them, which makes the identification with the chaste tree and its fruit clear.⁴⁰ Thus, all the earlier quoted recipes, where henna is translated, must be changed into this plant and its fruit respectively. Many unknown plants are listed in the ancient Egyptian medical texts, and if henna was known to the ancient Egyptians, it would be expected to be used among the *materia medica*. The question must thus be kept open.

2. PRESCRIPTIONS

Doctors had a big choice of *materia medica* to use, but they also had a strict protocol, as to how to carry out the treatment. First of all, they listened to the claims of the patient and investigated the symptoms themselves. They recognised among others fracture of the skull base, nasal septum fracture, or mastitis in the Smith papyrus.⁴¹ After due consideration, they decided how to proceed. In the Smith papyrus, where each case is written in a protocol, the usual formula is: „an ailment I will handle” (*mr jrj=j*) – „an ailment I will fight with” (*mr h3=j*) – „an ailment for which nothing is done” (*mr n jrwny*).⁴² In other protocols these sentences can be differently formulated,⁴³ or even omitted. For hopeless cases we can find for instance in Eb873b, 876d. „You shall not lay hand on such thing” (*jm=k wdj r mjt.t*), in Eb876d it even justifies it by saying that „it is a fatal case” (*ntj nw tp-r-B pw*). Another formulation is in Eb874c and 877b „Do not do anything against it!” (*jm=k jrj h.t nb.t r=s*). If they saw an opportunity in such cases, they prescribed medication to alleviate suffering, or advised a gentle resting posture.⁴⁴ These cases were no longer a medical task, one could only hope for help from the gods – mainly with prayers or magic spells.

When doctors were sure of a successful treatment, or fought for the

39 Dimiti Meeks raises the possibility of putrefaction(?) – MEEKS 1978, 129, no. 78.1365.

40 BARDINET 2019, 99-129.

41 Latest SANCHEZ – MELTZER 2012.

42 Case 1, 4 and 6 resp, for others see e.g. SANCHEZ – MELTZER 2012; ALLEN 2005; WESTENDORF 1999; DEINES ET ALII 1958; GRAPOW 1958; etc.

43 DUIN – SUTCLIFFE 1993, 12.

44 E.g. diagnosed as incurable disease, still as treatment is given to put the patient down in bed in Sm5, or let him eat a soup of carob beans, and sit him between two pieces of brick.

recovery of the patient, various remedies were prescribed, which they prepared themselves. These medicaments were listed one after the other in the medical papyri, often leaving out the title at the beginning, when the mixture referred to the same health issue as the previous prescription. Some medicaments were to be administered several times. The most frequent repetition was the magical number four, thus they often took the medicines four times, anointed the specific place four times, bandaged it four times, and the cures lasted four days.⁴⁵ They also had a special type of remedy called *hr-ꜥwj* “*immediately/at once effective*”. Interestingly, in Eb200 both immediately and four days appear together: “*bandage it for four days, so that he recovers at once*” (*wꜥt hr=ꜥ r hrw 4, r snb=f hr-ꜥwj*). Similarly, the immediately effective drink must be drunk for 4 days in Eb204. In other instances, one application was enough. In Eb191 = Eb194 it was even stipulated that the treatment should not be repeated. It happened in the case of the *wꜥꜥd*-disease, which is identified by Nunn with ischaemic heart disease.⁴⁶ Often, however, the frequency is not specified either, only keywords indicate what to do. One such typical, sketchy prescription is Eb443, which, in addition to its rational form, clearly shows the magical nature through the materials used to treat the *hnsy.t* head disease⁴⁷ – the disease was only written out much earlier, in Eb437, all the intermediate prescriptions start with “*another one*” (*k.t*).

The word for the *hnsy.t*-disease could end both with the non-open *pus* (Gardiner sign Aa2) and hair (D3) classifiers, which hint at a connection to the hair and to a dry condition of the scalp (scurf? in TLA after Ebbell). In some cases, it might, however, be moist because in Eb444-446, Eb448 it was treated by powder. According to this last recipe, it was administered in two phases: first powdered, and when it became dry, then oil/fat was applied to it. The disease was common enough to devote an entire book to it, the extant part of which was inserted into the Ebers papyrus (Eb437-449 series). The *hnsy.t* word is also mentioned in a very fragmentary literary text in Moscow about Amenhotep II. We learn from it that, when the pharaoh arrived, a *Hnsꜥ.t* goddess – probably for having been pacified – was adorned with *hkr*-jewellery. The act followed the destruction of the *hns.yt* disease.⁴⁸ According to the Egyptian way of thinking, she caused this disease, and consequently she could also cure it. We meet her already in the Pyramid texts, where she personifies the headdress of Sopdu,⁴⁹

45 NEMES 2008, 22.

46 NUNN, 1996, 90.

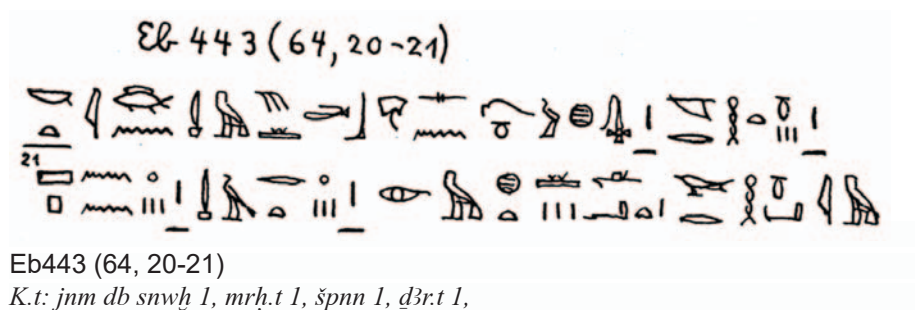
47 DEINES – WESTENDORF 1961, 661.

48 CAMINOS 1956, 27-39 und Tf. 8-16: A3,2. For translation see DECKER 1975, 40, document 9. For the story see also PARKINSON 2002, 226-234 und 311-312.

49 BARGUET 1950, who identifies her with a manifestation of Hathor, as the diadem of Ra, being originally the royal diadem of the Lower Egyptian king.

and again in the papyrus Brooklyn 47.218.84 (Dyn. 26),⁵⁰ where Sopdu is wearing a *hs3*-headdress, called *Hnsyt* goddess, and identified with the cow of Qus (XVI,10-XVII,3). Moreover, she is present with a cow-head on the naos of Saft el-Henna (CG 70021, Dyn. 30).⁵¹ Even later, in Dendera (I. 128, 9) – following the Middle Kingdom tradition –, she is on the head of Ra in the form of the uraeus, as his advisor. If the link Dimitri Meeks found by connecting her to the distant goddess and the wedjat-eye, is already valid during the New Kingdom, then we have a mythical event concerning the loss of hair: the wedjat-eye's hair was taken off by Thoth when it was enraged, as a spell among the Coffin Texts (IV.238b-243c, §335, and New Kingdom version in Book of the Dead, chapter 17) attests. Later the goddess Sekhmet, as the eye of Ra, is attested to have grabbed the hair of enemies when fighting them in battle.⁵² The identification of Hensit with the two eyes of Horus, is also attested on the wall of the Graeco-Roman temple in Edfu.⁵³

The fact that the quantities are given always by 1 unit in Eb443, indicates that this mixture was not a new one, but created before the New Kingdom, though not in a far remote past. It exemplifies well that the doctors followed the traditions for many centuries. The recipe contains two vegetal ingredients, the *špnn* and the *d3rt*.



Eb443 (64, 20-21)

K.t: jnm db snwh 1, mrh.t 1, špnn 1, d3rt 1,

Jrj m h.t w^c.t, wrh jm.

Another one: boiled hippopotamus skin 1, oil/fat 1, poppy seed(?) 1, carob fruit 1, make into one mass, and smear it.

50 MEEKS 2006, 43, 309-313.

51 NAVILLE 1887, pl. 5, reg.3.

52 GOYON 1974, 57, (II.8): ... *prj Šhm.t m Šty.t, hnp.n=s hnnks mntjw m Šty / Came Sekhmet from Asia, she grabbed the lock of hair of the mentjw-people from Asia ...* and p. 90, note 58bis.

53 BARGUET 1950, 4.

špnn / POPPY (*PAPAVER SOMNIFERUM L.*) | | | o 

The *špnn* might be some solid derivative of the poppy, if the *špn* can indeed be identified with the *Papaver somniferum L.*⁵⁴ It is used in New Kingdom medicine practically in two medical cases: to soothe a child who cries too much (Eb782), and to treat the *hnsy.t*-disease (Eb440, Eb443, Eb445). Much later, Dioscorides (4.65) tells us an ancient Egyptian name for the poppy transcribed into Greek, the *wanti* and for the red poppy (*Papaver rhoeas L.*) in his previous paragraph, the *nanti*. However, their ancient Egyptian equivalents are unknown.

The sleep-inducing character of *špn / poppy* administration fits well into the later use of both *Papaver* species, as it is written down by Dioscorides (50-70 AD),⁵⁵ although the fly drops, mentioned earlier, are no longer an ingredient of the drink. The decoction of poppy leaves and capsules was used to heal inflammation and infection (*erysipela*), again a purpose which might be taken in parallel with the treatment of the *hnsy.t*-disease, the above affliction/condition affecting specifically the head. Dioscorides also gives some further uses, as does Pliny the Elder (XX.76): the poppyseed impregnated by vinegar was thought to be a cure for *erysipelas* infection and wounds.

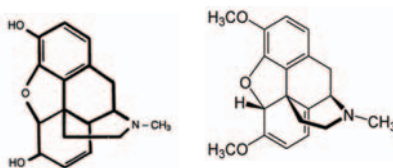


Figure 2. Poppy field (source: Wikimedia) and molecular structure of morphine and thebain.

54 GERMER 2008, 311-313. For the question of identification see FEHÉR ET ALII in this volume. In Bryan's Ebers Papyrus *h3sj.t* is translated as poppy, and in popular and non-Egyptological professional literature prescriptions containing it are still quoted to show how often poppy was used as medicament (e.g. HALPERN-BLISTEIN 2019, 28-29, although it writes immediately behind this statement, that *špnn* is the *poppy seed* – the remark in note 5, on page 34 originates also from the *h3sj.t*-identification). The *h3sj.t* plant is still unidentified, but we know that it has a small tail, which was put into remedies to be consumed, and fruit, root and herb were also used in varied sorts of medicine by consuming, smearing, placing on the skin or fumigating. See GERMER 2008, 98-100.

55 The latest translation of his *De Materia medica* is OSBALDESTON 2000.

The poppy was thus an important ingredient in traditional medicine in classical times. The technique of poppy and opium production seems to have been invented in Cyprus or Crete,⁵⁶ when they had contact with New Kingdom Egypt. This use, however, seems to have been transferred to countries including Egypt centuries later. In the pharaonic period, we can find only a few red poppy plants' remains, but its popularity as an ornamental plant is well attested by the garden scenes and high floral bouquets of New Kingdom banquet scenes. As such, the elite probably used it. During the Ptolemaic period, however, the poppy was grown in fields to extract the opium. Egypt became one of the biggest producers by the 19th century AD. Famous was the *sal Thebaicum*,⁵⁷ named after the production site, the Egyptian Thebes.⁵⁸

During New Kingdom Egypt, it seems that it was not yet known, how to produce opium, and it was most probably imported in special vessels,⁵⁹ in the shape of the poppy head. With the container they might not only have brought the drug to Egypt, but also related ideas. Its use was connected in Crete to a sanctuary,⁶⁰ and the statue of a goddess there wore three poppy pods around her head. Again, a fumigating tube was found beside the special vessels there, as in a Kition sanctuary in Cyprus. The Mycenaean culture seems to have known it too⁶¹ – the forgetfulness-bringing *nepentes* used by Helen in the *Odyssey* (IV. 1. 221) might be opium. Interestingly, it was traded to originate from Egypt. Several hundred years later, Hippocrates used the poppy-juice *μηκώνιον* / *meconium* by preference as a purgative and narcotic for the treatment of an inflamed anus.⁶² The goddess Morphe personified it in classical mythology. Some elements of the mythical background might have also been taken to Egypt, although the scarce Egyptian sources on the poppy do not yet give any hint.

Based on the chemical constituents of the drug, such as the alkaloid rhoeadine, morphine, thebaine, papaverine, etc.,⁶³ it was rightly considered

56 NÉMETH 2018.

57 It is still used in traditional medical Latin for *Morphinum hydrochloricum*, see SÁRY 2012, 17. Plinius NH. 19,1,53: enumerates the *P. somniferum album*, then the *nigrum* – mentioning in the case of this last one the incision made to collect latex.

58 NIKOLICS-VINCZE-ZELKÓ 2010, 102.

59 ASKITOPOULOU ET ALII 2002, 24.

60 JULYAN – DIRCKSEN 2011, 75-76, NÉMETH 2018, 60-61. He refers to BEHN 1986, 193-197, I-III. and SAUNDERS 2014.

61 ASKITOPOULOU ET ALII 2002, 23-29.

62 see Hippocrates, *On Regimen in Acute Diseases*, *Appendix Part* 36 and 39 or *De fistulis*, 6.

63 Other chemical constituents are e.g. papaverin, allocryptopin, berberin, coptisin, roemerin, sinactin, depside, meco-acids etc. See Dr. Duke's Phytochemical and Ethnobotanical Databases: <https://phytochem.nal.usda.gov/phytochem/plants/show/1429?et=> and <https://phytochem.nal.usda.gov/phytochem/ethnoPlants/show/744?qlookup=Papaver+somniferum&offset=0&max=20&et=>

suitable for widespread use in the treatment of many diseases. In the present case, perhaps the analgesic, anti-inflammatory, bactericidal, calmative, and febrifuge effects were used.

d3r.t / CAROB (*CERATONIA SILIQUA*) 

The other vegetal drug used was the carob pod (*d3r.t*), a word not yet attested during the Old Kingdom. The tree (*ndm*) is native to Egypt from, at the latest, the Middle Kingdom period,⁶⁴ though Egyptian social memory tied it to the first dynasty, so much it was expanded by the New Kingdom. Egyptians found the sweet taste of the pod so important, that even the tree got the *ndm* „sweet” name. The pod’s flour is suitable for baking. Edible gum can be extracted from the seed, which can be used to replace tragacanth resin – this glue might have been used by the ancient Egyptians as an adhesive. Due to its stabilizing and thickening agent, it is also used instead of eggs.

The carob pod (*d3r.t*) appears also in the mythology. Namely The Book of the Dead chapter 64 contains an explanatory sentence, where the *d3r.t* has fallen down onto the back of the *benu*-bird symbolising rebirth, and the two companions (of Osiris).⁶⁵ We can find mythological reference to it also in a Middle Kingdom Turin incantation against snake bite:⁶⁶ Its blood and sister are called *d3r.t*, while its gift and mother is the cut wood (*ht*), possibly of the same plant, thus the two most usable parts of the carob are identified both with the evil snake and its kinship. In everyday life the carob fruit became a staple food, and was used as a sweetener – in the admonition of Ipuwer, it is listed among the destroyed deliveries of the palace (3,11).

The root of the word *d3r.t* is *d3r* “(human) need” or “helper”, depending on the classifier. The same *d3r.t* word could also mean scorpion, which hints at a perception of similarities between them. Perhaps this name was given precisely because of the prickly branches of the plant. If this association existed, it could easily be linked to the goddess Isis.

64 VARTAVAN ET ALII 2010, 73. The word *d3r.t* in HANNIG 2003, for the Old Kingdom is not to be found. The name of the tree *ndm* is attested twice from the First Intermediate Period, although the classifier is a date palm, which might hint at a tree known only by reputation to the scribe. It might mean that the tree was still not domesticated, and getting such a pod was the privilege of the elite.

65 pCairo CG 51189 (pJuja / https://aaew.bbaw.de/tla/servlet/GetWcnRefs?u=guest&f=0&l=0&ll=*182260&wt=y&lr=0&mo=1&db=0&of=42 (last check: 12.12.2022)) – in the parallel text of Nu, instead of *d3r.t* the „evil” / *d3j.wt* can be read, while in a Turin papyri *d3r* „ennem”.

66 pTurin CGT 54003, recto, 1-8, ROCCATI 1970, 23.

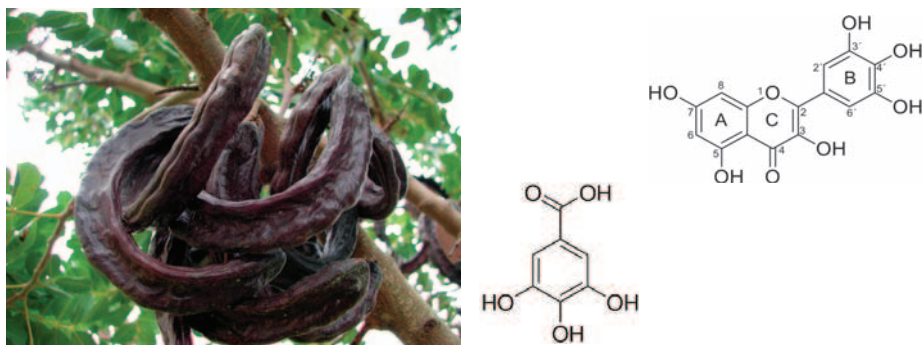


Fig. 3. Carob pod (source: Wikimedia) and molecular structure of gallic acid and myricetin

In medical texts the *d3r.t* is used very often without any addition, but also by naming its part or form. We find it mostly as flour, sometimes as seed, or its fluid is listed.⁶⁷ There are some problematic cases: we do not understand the word *wjt.t*, thus it is questionable whether *wjt.t n.t d3r.t* (Eb501) refers to a part of it, or to a form it is made into, as *db.t n.t d3r.t* (L21), „carob pod-brick” which might be a pressed concentrate. The *prt d3r.t* is again unusual – why to write out the carob pod-fruit, when the name carob pod means fruit in itself.

The use of the *d3r.t* focused on the respiratory system (treating coughs, lungs, chest), emptying the stomach, muscle function (stiffness), wounds (also burns, fractures) and various swellings, but it was used again in many other cases. The method of application was also varied (food, drink, ointment, suppository, enema, poultice, bandage, fumigation), and based on the classifier (usually N33 or M33), in powder form. It does not seem to be important in classical antiquity.⁶⁸

Based on scientific analyses, the pod flesh contains several chemical elements, as for example a high amount of gallic acid, various glycosides, or myricetin rhamnoside, and is highly nutritional because of its saccharins, proteins, fat and carbohydrate content.⁶⁹ Its polyphenols have an antioxidant

67 E.g. for flour (*dkw n d3r.t* – e.g. Eb8, Eb93, Eb94, Eb107, Eb155, Eb160, Eb163, Eb164, Eb243, Eb245, etc.), seed (*jmj n d3r.t* – e.g. Eb127, Eb153, Eb184, Brl185, H76, etc.), fluid (*mwn d3r.t* – e.g. Eb135 = Eb150, Eb136 = Eb151, Eb399, Eb462, Brl43, H45, Eb143, Eb159, etc.) – it can only be a drink made from it.

68 Dioscorides (l.158) wrote only: „*Keratia: The pods (taken while they are fresh) are good for the stomach and loosen the intestines, but dried they are bad for the stomach and are diuretic, especially combined with the remains left after pressing out grapes*” (tr. by OSBALDESTON 2000)

69 <http://sun.ars-grin.gov:8080/npgspub/xsql/duke/plantdisp.xsql?taxon=244>, <http://www.pfaf.org/database/plants.php?Ceratonia+siliqua>, <http://www.freepatentsonline.com/20040265404.html>

and anti-cancer effect. Ethnobotanical research yielded only few medical uses. Its use as a hemostatic and laxative, and as a cure for warts, gout, cough, glandular inflammation, mononucleosis and chest pain are attested.⁷⁰

ASSESSMENT

The prescription analysed is formulated sketchily but is professional by ancient Egyptian standards. It is completely rational, with ingredients curing inflammation and relieving pain of the head, which seem to accompany the *hnsy.t*-disease. It is an ointment, which is made of four ingredients. The first is a cooked hippopotamus skin (*jnm db*), followed by oil/fat (*mrh.t*), poppy (*špnn*) and carob (*d3r.t*).

The applications of the ingredients in the prescription are rational: The hippo skin was cooked; its collagen and elastin gave elasticity and firmness to the skin. Oil/fat protected the injured scalp from dryness, keeping it moist, both plants reduced inflammation, the poppy relieved pain, and the carob besides the antioxidant activity nourished the scalp.

Parallel with this physico-chemical treatment, all the *materia medica* provided divine protection as well. The fierce hippopotamus wildly protects its protegee from all kinds of harmful creatures, the oil/fat is a general transmitter of divine power, and the carob linked the patient to snakes, which keep away others of the same kind. The poppy had in its homeland a goddess who gives a pleasant feeling to her followers. An intangible divine power might hover around it even in Egypt.

3. ANATOMICAL BACKGROUND: *mtw*-SYSTEM

Ancient Egyptians also had an idea, how their body worked. Based on ideas attested in New Kingdom medical papyri, a basic feature of the ancient anatomy was the *metu* (internal channel or tube). It led in pairs to every point of the body. Examining them before setting up a diagnosis, was the task of the doctor (*swnw*) as well as the “*pure*”/*w^cb*-priest of the goddess Sekhmet or the magician (“*amulet/protection-man*”, *s3w*). Some activities were performed by other specialists. Circumcision, for example, was the task of *ka*-priests, the treatment of snakebites and scorpion stings belonged to the field of the priests of the goddess Selket, while the tasks related to epidemics fell to the priests of Sekhmet. Beside the medicines and other treatments, which were performed by doctors and health specialists, ancient Egyptians hoped to achieve recovery by praying to the gods or by casting spells.⁷¹

70 <http://www.ars-grin.gov/cgi-bin/duke/ethnobot.pl?ethnobot.taxon=Ceratoniasiliqua>

71 For further details of healing persons see e.g. GYÖRY 2001.

It was considered important to study the pulse through the “*speech of the metu*”, which they thought to come from the heart. A weak, oppressible pulse was considered a bad sign. Although the examination is mentioned in the Smith papyrus, the system itself is described in the contemporaneous Ebers (Eb854-856) and the Ramesside Berlin papyrus (Br1163). The treatises in the Ebers papyrus specifically deal both with the healthy and the pathological *ukhedu* mechanism of the system, while the Berlin papyrus only with the mechanism of the pathological system related to the *ukhedu*-material. These are the earliest extant theoretical works, which describe the ideas in connection with vital functions on a rational basis, albeit rather imprecisely, according to our knowledge today. The Egyptians themselves derived the pathological knowledge from kings of the first and the second dynasties.⁷²

These texts attest the connection between digestion and excretion, and the vital role of breath and blood were recognized early on. Egyptian doctors developed namely a cardiocentric concept: each *metu* originated from the heart, and transported air, blood and fluids such as tears, urine, or semen to all parts of the body, then the *metu*-pair returned to the heart. The heart was considered the center not only of fluid exchange, but also of perception and thought, and had a controlling role.⁷³ If the word “*mouth of the heart*” (*r3-jb*) is understood as stomach, although this is not generally accepted any more,⁷⁴ we can conclude that Egyptians did not see the difference between the functioning of the heart and the stomach, and the heart was thought to be directly involved in the work of digestion. Figuratively, this is certainly true, since one of the accompanying phenomena of the blockage of the “*mouth of the heart*” is the burden in terms of eating bread (*dns=f⁵ r wnm t*), as we can read in the recipe Eb188. (As, however, the “*bread*” could be used as generalized term for food, this expression also means severe lack of appetite, which fits well with the absolutely weakened health state described in the diagnosis.) They also interpreted the respiratory functions differently. In this connection, it turns out that the “*breath of life*” enters the body through the right ear canals and the “*breath of death*” through the left ear (Eb854f).⁷⁶

72 GYÖRY 2003a.

73 Cf. the book of Csaba Nemes, medical historian, anesthesiologist (NEMES 2008).

74 since the analysis of the anatomical terms by WALKER 1996.

75 HW.I.1478: *dns* „to be heavy, under pressure/ burden”. HW.II.2791-92: „heavy, serious, important, compelling (reason)”.

76 Although in the same place, with the introduction of „another saying”, the shoulder is also named as an entrance. This is where the ear canals go. „He has four *mtw* to the two ears: two *mtw* on the right shoulder, two on the left shoulder. The breath of life enters through the right ear, the breath of death through the left ear. Another saying: That enters on the right shoulder, and the breath of death enters on the left shoulder.” (GYÖRY 2002, 52)

Indeed, ancient Egyptians thought the disease to be caused by an evil supernatural being/substance entering the body: it could block any *metu* or reach inside anywhere through it and thus affect the function of any part of the body. The theory of the rational system is written down in the case of the *ukhedu*, while the practice is described in the many recipes of the medical papyri. The religious practice is presented by the healing magical papyri. Reading the iatromagical texts, we meet the supernatural beings or their substances inside the body, and find spells, rites and appropriate amulets, with which the body, thus the *metu*-system, which was investigated also by the priests and the *s3w*-magicians, could be cleaned, and the patient could get rid of these divine creatures and their substances.

The *metu*-system formed the basis of ancient Egyptian physiology and pathology – at the latest before the New Kingdom – and was an integral part of the mythical anatomy as well. From early times, the human body had mythological connotations: the individual body parts were identified with different gods. The relationship between the body parts could be imagined on the model of the Nile, thus the connecting link between each body part could be the *metu*-system. If the Egyptian concept of the origin of the above treatments really goes back to the time of the foundation of the kingdom, the system is rooted in the prehistoric era. We can compare its operation with the phenomena observed on the river: just as, for example, the silt of the Nile floods, dries up or clogs the canal systems of the fields, in the same way secretions and disease demons can flood the body canals or block them; or heat, i.e. fever/inflammation, can dry out the body.

We may find several principles in the usage of various materials. One of the healing methods is called the “*opposite with opposite*” (*contraria contrariis*), which is also a magical device, when for example the healing is attempted by the use of excrement, hated also by all malignant spirits (e.g. Eb531: faeces against the *sβ*-secretion). We find this method also among native peoples, and it remained the dominant therapeutic method of official doctors until the 19th century,⁷⁷ together with another often used option, the “*similar with similars*” (*similis similibus*) when the effect was built on the similitude (e.g. scorpion plant against scorpion bite in the story of Ra and Isis, pTurin31+77,3-5⁷⁸).

Although Egyptian priests performed mummification, the Egyptian doctors did not have significant and deep anatomical and physiological knowledge, and they often could not rationally explain the exact localization of the symptoms, or the cause of the disease, yet they successfully cured many of them. The knowledge gained through experience was brought thus

77 NEMES 2008, 23.

78 ROSSI – PLEYTE 1876, I. 170-180, II. pl. 131-133; WESTENDORF 1999, 72-73.

into contact with the divine world. They asked for the intervention of several gods who helped in healing (e.g. Thoth, Isis, Sekhmet, Hathor, Heka and later Imhotep) in order to find a solution to their health problems and to help in the healing process. Medicine was therefore permeated by both mythical and experimental healing. As a result, medicine constantly crosses the blurred border between natural science and religion, and within that, magic.

The practice of witchcraft assumes that the gods can be influenced by promises, evil spirits can be urged to leave the patient's body by threats, or they can be forced to flee with various abominable substances, or kept away by magical walls or rites. It also was believed that human suffering could be transferred to the animal. For example, the swallow could carry away babies' *baa*-disease in its beak, as we can read in the instructions of a healing magic papyrus (Ram III.B 23-34), – that is, the disease was transferred to the animal-scapegoat.⁷⁹ Medicines were thus selected and prepared according to magical principles.⁸⁰ Obvious magical medicines related to, or counter diseases are, for example, the blood of various animals used against certain bleeding diseases,⁸¹ or cat grease was used against mice.⁸² This last practice can be read in the medical Ebers papyrus: according to the prescription, it had to be applied to everything from which it was desired to deter mice (Eb847).

We do not find pharmacies or pharmacists in ancient Egypt; at most a doctor entrusted a person in his service with the collection of raw materials, but the prescriptions were prepared by the doctor himself (regardless of his secular or religious background), accompanied by a ceremony addressed to the gods. We know only a few of them, but even so, they show that the way to make a material effective was by a ritual, as e.g. in preparing beer (H216), making a drink (Bln184), using the *mrh.t*-oil/fat (H214), red oil (Brl185) or green oil (Brl186), or honey (H215). Let us see an example.

Eb 224 (44,19-22) = H 82 (6,15-16)

It is a very rational recipe, where the disease-causing material is the ʕ^{c} , which had spread in the body and also in its *metu*-system centered around the heart, as given in the title of the book: „*Beginning of the medicaments of expelling the ʕ^c-disease in the body and in the hati-heart-system*” (*h3t-ʕ m phr.t n.t dr ʕ^c m h.t m h3tj*), which introduces the different treatments of this disease,

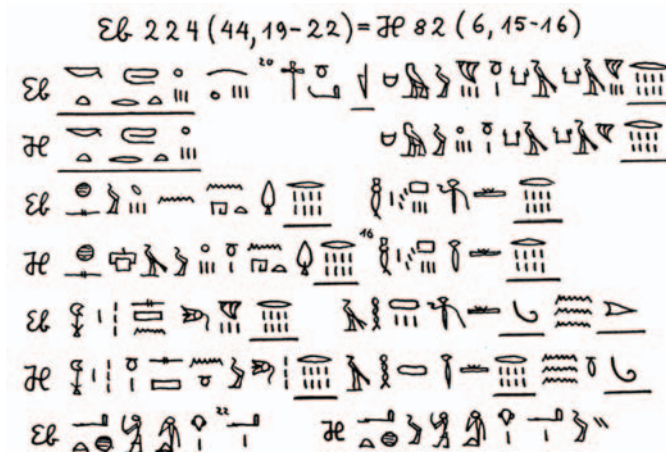
79 SCHOTT 1993, 22.

80 GYÖRY 2002. 63-71.

81 E.g. H17 where diarrhoea is treated by bull-blood. See also SCHOTT ET ALII 1993, 17.

82 SCHOTT 1993. 17. The tom-cat's fat (*mrh.t mjw*) also occurs together with the fat of other animals as a component of ointments (Eb465. Eb627=H96) and poultice (Eb658), or hair (*snj*, Eb486), faeces (*hs*, Eb213, Eb488=498, Eb578, Eb580, Eb584=H41, Bln64, Brl70) and pus (*ry.t*, Eb208) were also used.

which is attested in two different medical papyrus, the Ebers (Eb221 (44,13-15) and the Hearst (H79 (6,11-12) with slight variations.



Eb 224 (44,19-22):

K.t phr.t:

w^{ch} nd 5, hm.w n.w k3k3 1/8, hs[3].w n nh.t 1/8, bnj w3d 1/8, h3w sšn 1/8, 3h w3d 10, mw 20, th, swj, hr-^c[wj].

Another remedy:

tigernut crushed/ground 5, hm-part of the kaka-plant 1/8, hs[3].w of the sycamore 1/8, fresh/green date 1/8, leaves of lotus 1/8, fresh/green 3h-mash/dough 10, water 20,

sieve, drink, immediately (effective).

Comparing the two varieties of the prescription, we can see that the Hearst papyrus left out the tigernut, and had used a different amount of dough and water, but otherwise only the orthography differs, thus four or five different vegetal material was used. Depending on the consistency of the dough, the change in proportions could also affect the consistency of the medicine, since the amount of 20 units of water and 20 units of dough reflects a significant difference. The Hearst Papyrus was recorded somewhat later than the Ebers Papyrus was, so it is conceivable that the change was made for efficiency, but the different find spots may also reflect different local variations.

w^{ch} / TIGERNUT (*CYPERUS ESCULENTUS* L.) 

The tigernut tubers are ancient food in Egypt, collected already during the predynastic period as staple food. For instance, in Hieraconpolis HK43

cemetery a basket full of vegetables contained it (B333).⁸³ Gods and people consumed it during both pharaonic and later times. It is mentioned among the vegetable offerings and also among the usual deliveries for the palace (Ipuwer 3,11).

Drink was made of, and cakes. In pSm7 (3,15), at the end of the protocol, in the case when the acute stage of the head injury was over, and the patient was weak, he needed a strong strengthening agent, which was a kind of drink made of tigernut (*shb.w n w^ch*).

Based on the surviving written material of the Coffin Texts, the tigernut was part of the feast organised for the reanimation of the dead for the afterlife (CT67 and 72). Thus, the small underground tubers were not only eaten, but were also sacrificial food prepared for the gods in the funeral cult. In a New Kingdom papyrus⁸⁴ the act of writing is compared to a sort of cake made of tigernut (*b3y w^ch*), which had to be delicious, as the writing is declared by it to become all the more pleasant. The paintings in the tomb of Rekhmire illustrate the preparation of a wedge-shaped cake from its flour for the Amun-temple.⁸⁵ Even today, the tiger nut is consumed and grown for the 2-3 cm long root tubers, which are rich in carbohydrates and oils. Thus, tigernut was and is used beside everyday consumption also as delicatessen and roborative agent.

We can read about its medical use in several medical papyri. In terms of the scope of its use, it was thought to be beneficial in gynaecological, traumatological and dental cases, together with several other *materia medica*. The joint use allows us to conclude that the medical effect of it on its own was not sufficiently strong, or that it played the role of a nutritious filler in the medicine. The antitussive and expectorant effect of the plant seems also to be recognized.⁸⁶ Looking into details, we can detect, however, a more nuanced picture. It was a general roborative (Sm7 the only drug to strengthen the weakened organism), and a *metu*-regulator, concentrating mainly on the area of the belly and *jb*-heart and some pathogens in the fluids of the *h3ty*-system. It was also consumed for various skin conditions. Another main usage was with bandages usually on burn wounds. Thus, it seems the Egyptians used it as a general remedy for the body-system, to strengthen it.

83 NEKHEN NEWS 15, 2003, 20.

84 pLansing = pBM EA 9994, recto 2,3-3,3.

85 GYÖRY 2011, 89-90.

86 GERMER 2008, 53-54.

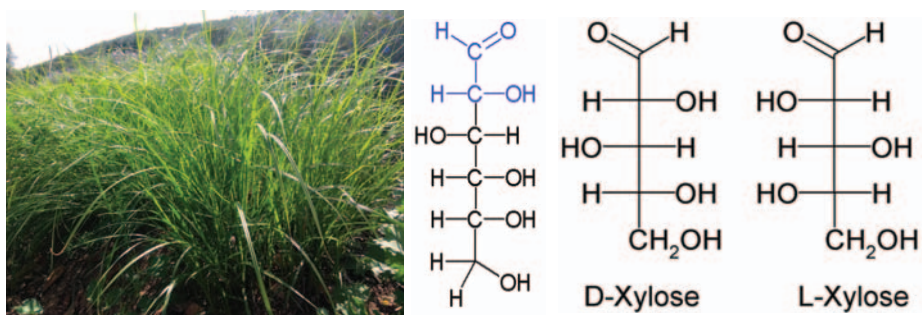



Fig. 4. Tigernut plantation (source: Wikipedia) and molecular structure of arabinose and the two types of xylose (<https://www.differencebetween.com/what-is-the-difference-between-arabinose-and-xylose/#Arabinose>)

Based on the latest phytochemical tests, in addition to the rich content of xylose, arabinose, glucose, uronic acid, galactose, among others, there is also a small amount of mannose in the cell walls. The cell wall of the parenchyma tissue shows uniform pH-dependent autofluorescence, which indicates the presence of cinnamic acid derivatives. The wall of the peeled root trunks is also rich in ferulic acid, and the monomeric phenol fraction of the peel is dominated by p-coumaric acid. The cell wall of both skinned and peeled root trunks contains a significant amount of different types of diferulic acid. Tiger nuts intended for consumption contain 20-36% fat with a composition similar to olive oil. Among the minerals, phosphorus and potassium stand out in particular, but the tiger nut also contains little sodium. At the same time, it is gluten- and cholesterol-free. The weed version contains significantly less oil (9.9% / 25.5%), and the content of carbohydrates (44.9%) and sucrose (13.8% / 17.4%) is also lower.⁸⁷

k3k3 / CASTOR-OIL PLANT? 

The castor plant might have two names, the general *dgm*, and the *k3k3*, found in the above recipe. This last identification is, however, not accepted by all researchers, as only spellings with the herb classifier are known, although the plant grows into a tree, and the purgative effect characteristic of

87 E.g. MARCHYSHYN ET ALII 2021; ADJEDI-DUODU 2014; PARKER ET ALII 2000; VEGA-MORALES ET ALII 2019; MAKAI – BALATINCZ; CANTALEJO 1997; ETESHOLA – ORAEDU 1996; GAD – OSMAN 1961.

the castor is not reported.⁸⁸ Based on the Greek „*kiki*” name of the castor-oil plant (Dioscurides IV. 161)⁸⁹, Keimer still translated it as castor-oil plant,⁹⁰ and Koemoth accepts also this identification.⁹¹



Fig. 5. Castor oil plant with flowers and its beans (source: Wikipedia)

Ricin was not eaten, being toxic, but the wide use of its oil as lamp-oil is well attested.⁹² It also belonged to the landscape of the Nile valley, at least in the Southern part. The plant had from the Middle Kingdom at the latest a religious connotation, as the attribute “*those who are on the k3k3-plant*” in spell 660 of the Coffin Texts (VI.281e) implies its being associated with solar

88 GERMER 2008, 143-144. Germer mentions the Br197, which ends with the remark of letting the patient drink to vomit, but the vomiting has nothing to do with the mixture prepared: it is to anoint the patient who has temperature/inflammation („is under the *srf*” *lgs.w s jm hr srf*), and as an accompanying act is given the instruction to let him drink in order to vomit (*hn^c rdj.tw swj=f r k^c*) – and it is not written what sort of fluid the patient had to drink.

89 Although he said that the Egyptian name is *Systhamna*. He also mentions that the crushed seeds can be used as a poultice to eliminate acne and freckles, though the main area of use was as a laxative.

90 KEIMER 1924, 70 and 164; KEIMER 1929, 103. Cf. SANDY 1987: kroton = *Croton tiglium*, WAGNER 1980, 255, n. 8.

91 KOEMOTH 1994, 23-30.

92 Herodotus. II. 94 even described cold and warm ways to produce it. See also Strabon XVII, 2,5 and Plinius NH XV, 7, 25

gods.⁹³ The Mother and Son Papyrus called it the plant of the goddess Satis (*k3k3 Š3jt*, pBerlin 3038,97). In the depiction of the Qadesh battle, the attack of the Pharaoh Ramses II is described with a metaphor: „*he was like a wind which came out of heaven, his power was like the fire in the kaka-plants; he was powerful like his father Month*.”⁹⁴ The same plant in the form of *kjkj* was protecting Osiris, while he was being revived, in the tomb of Wenenef (TT157), which became a usual context for him by the Ptolemaic period.⁹⁵

During Dynasty 30, we find the *kaka*-plant even as a divine being, whose egg fell(?) toward the earth and was born as – unfortunately due to the fragmentary nature of the text – we do not know who/what.⁹⁶ As this statement is in a spell of the nine-headed Bes, it might be a historiola invented in a magical context, but the connection to creation is clear both by the content of the text and the classifier of the word (phallos with semen). Based on a wider context, this deity might be related to Amon-Ra.

If the Graeco-Roman *kk* is the same plant, then it grew in the marshland.⁹⁷ In the Papyrus Bremner Rhind (pBM 10188: 18,25) and other Ptolemaic ritual papyri, Sokar is called among others „*the noble kaka-plants of the large-temple*” (*kk.wt šps n.w hw.t ʿ3.t*) when he was taken out of the *shetait*-sacuary, and came to new life. According to the inscription of a Horus cippus from the Late Period, Horus was protected by the goddess Bastet on the “*kk-hill*” (*j3.t kk*), near the tomb of Osiris in Herakleopolis.⁹⁸ Another *kk-hill* is known from Esna.⁹⁹ It seems thus, that in some local traditions in Upper Egypt Isis hid with her child in such bushes instead of the papyrus thicket. In the Edfu temple, Horus Behedti was very visible without *kk*-plants around, when he threw his third harpoon at the Sethian animal in the water.¹⁰⁰

All in all, this plant seems to be a high, fast growing marshy/river-side plant forming a thicket, suitable for hiding in it. Nevertheless, it is also tindery, burning with mighty flames. It might originate from Nubia or could have a Southern variety. Interestingly, a name for the *blister* sounded very similar:

93 SCHLÖGL 1977, 15.

94 Abu Simbel, KRI, II. 134,14: *jw=f mj dʿ.w, prr=f m p.t, wsr=f mj h.t m k3k3.w, jw=f šhm=f, mj jt=f Mntw*. Cf. also 319,11. GYÖRY 2011. 56, 99-100. <https://aew.bbaw.de/tla/servlet/GetTextDetails?u=guest&f=0&l=0&db=0&tc=20520>.

95 KOEMOTH 1994, 26-28.

96 SAUNERON 1970, 18-22, pl. I. [x+1,3].

97 MEEKS 2006: it grew on the corpse of Osiris under water; in Karnak Opet temple the *Seshem*-marshland (in the 7th nome of Lower Egypt) is under its kaka-plant (*pḥw sšm hr kk=f*).

98 DARESSY 1894, 48 = CG9430; Koemoth 1994, 25.

99 KOEMOTH 1994: 24, n. 117.

100 *Edfou*, VI, 66, 11; BLACKMAN – FAIRMAN 1943, 10, note b.

sycamore figs are often seen with their characteristic circular incision, which may have symbolized the defeat of Seth.¹⁰⁷ The tree appears already in the earliest religious texts. “*The sycamore of the eastern horizon*” is mentioned, next to which the sun god was born each morning. From the Middle Kingdom, the two turquoise sycamore trees stand here. One of the attributes of Ra in Heliopolis was, “*he who comes out of the sycamore tree*”, thus it contributed significantly to his cyclic life. He could also be identified with it. Again, the dead could be identified with the sycamore tree of the Western horizon (BD64). In the Graeco-Roman period, in the Mystery of Osiris in Dendera, the dead Osiris rested on the branches of the sycamore, while at the latest from the New Kingdom period the tree could incorporate the goddesses Nut or Hathor, giving nutrition to the deceased person, thereby enabling his/her regeneration, and rebirth in the Afterlife. He hugged (*hpt*) the sycamore, and it shielded (*nhj*) him in the Book of the Dead, chapter 64. Its branches became the “*locks of hair*” (*sm3w, šnjw*) of Nut-Hathor.¹⁰⁸

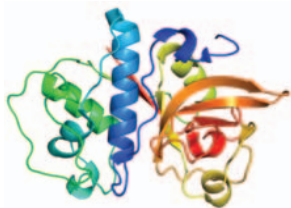
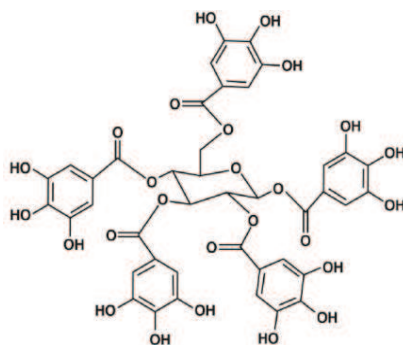


Figure 6. Sycamore figs (Source: Wikipedia) and molecular structure of gallustannin and crystallographic structure of ficain

The good spirit, living in the tree became an evil djin by the middle ages, which idea held so strongly even at the beginning of the 20th century, that Viktor Cholnoky (1868-1912), interested in contemporaneous Semitic culture, retold a story mirroring this belief.¹⁰⁹

107 KOEMOTH 1994, 95.

108 HERMSEN 1981, 79.

109 CHOLNOKY 1913.

In medicine, even more parts of it were applied,¹¹⁰ than in everyday usage, so much so, that four different names are known for the fruit itself, and many other parts were also in use.¹¹¹ The *hs3w*-part¹¹² in the recipe is also found with the *jm3*-tree (*Maerua crassifolia* Forsk.¹¹³, e.g. Eb248), but cannot yet be identified. In some occurrences, the sign of the seed follows it (e.g. Eb283), in other cases it is accompanied by the classifier which indicates that it is a grit or a powder-like material as in this recipe. This duality perhaps indicates that it may have been in a borderline state, or that there were several processed forms of it. Grapow raises the possibility of it being something such as a “nut gall”.

Its application is diverse: It was used e.g. against *hf3.t* worms (Eb65 – *k3.w šw.w*, Eb72 – *ḳ33*), *wh3w*-rash (Eb110 – *p3dt.t*), rectal inflammation (Eb154 – *tp3w.t*), for chest treatment (Eb184 – *wty.t*), right side obstruction (Eb210 – leaf), for the *r3-jb* (Eb212 – *nk5w.t*), or to eliminate *ʕ3ʕ* (Eb224 – *hs[3].w*, Eb240 – *nh.t*). It is rarely mentioned without clarification of the applicable part¹¹⁴. Ancient Egyptians made a poultice for a broken bone (H234), put its milk on a painful tumour (E570), cut the fruit to treat the liver (Eb477, 480, 481), the swelling on the tooth (Eb554, 741, 747, 749=H9), the anus when inflamed (Bt30), and its sawdust was used to soften the *mtw* (Eb663). The food and drink preparations predominated. The widest range of its substances was used here, only sawdust and milk are not included among the internal drugs. In the discussed case, the *hs3.w* part is named.¹¹⁵ This same part is used only in Eb283 again, which seems to be a variation of this recipe, although the aim is very different: regulation of urine with first menstruation. The lack of *wʕh* is insignificant, being mainly roborative, but among the significant active ingredients, the *sšn(n)* is replaced by several other ones (*h3sy.t*, *sntr*, *gjw* and *jsf of the baker*). The common element shared between the two types of application seems to be that in both cases they affected the *metu*-system. Thus, it might be expected that it expels the trouble making element or protects the *metu*-system.

110 GERMER 2008, 86-88.

111 *jšd.t* / „fruit“, *nk5w.t* / „incised sycamore fig“ (according to Plinius, NH XIII, 56, it was called „Egyptian figue“, *k3w és ḳ33* (dry? and other edible form), *jr.t* / „latex, (sycamor)milk“, *wty.t* / part in some kind of powder, perhaps „barkpowder, -extract“, *p3dt.t* / based on the classifier, small ball-, or ringshape, *tp3.wt* / fine-grained, powder-like part.

112 HW.II.1940: plant – combustible material.

113 BAUM 1988: 193. – assumes because of the scent.

114 against *ʕ3ʕ* - Eb240, for burns – Eb490, for wound treatment – Eb732, Sm46, and for finger tremors – Eb623.

115 This same plant-part is known only in the case of the *Maerua crassifolia* tree, there, however not consumed but as part of ointments for wound treatment, ill effects on the body and against hair-greying, thus they are different fields. (GERMER 2008, 26, DEINES – GRAPOW 1959, 402).

recipe	purpose	<i>bnr</i> <i>w3d</i>	<i>mw</i>	<i>nh.t</i>	<i>wch</i>	<i>k3k3</i>	<i>sšnn</i>	<i>3h</i>	<i>prt šnj</i>
Eb283	regulation of urine with first menstruation	1		1 (<i>hs[3w]</i>)		1 (<i>mnyt</i>)		<i>h</i>	<i>with other drugs</i>
H82	expelling the <i>ꜣꜣ</i>	1/8	10	1/8 (<i>hs3w</i>)		1/8 (<i>hmw</i>)	1/8 (<i>h3w</i>)	1/8 (<i>w3d</i>)	
Eb224	expelling the <i>ꜣꜣ</i>	1/8	20	1/8 (<i>hsw</i>)	5 (<i>nd</i>)	1/8 (<i>hmw</i>)	1/8 (<i>h3w</i>)	10 (<i>w3d</i>)	

According to our knowledge today,¹¹⁶ the plant contains many chemicals, but some of its parts are poisonous when ingested! It can cause skin rashes and allergic reactions when touched. Characteristic of sycamore milk obtained from tree trunks is the ficain content. The extract taken from the bark of the trunk exerts a significant inhibitory effect on the contraction of smooth and skeletal muscles of the duodenum and recti abdominalis by reducing the contractile responses of acetylcholine. Its main components are gallotannin, saponins, reducing sugars, alkaloids and glycoflavonoids. The fig extract shows anticancer activity and a significant antibacterial effect (in the potato disc bioassay). Its ripe fruit is a mild laxative.

bnr / DATE (*PHOENIX DACTYLIFERA*) 

Being a throughout the year easily available and frequent fruit, it is understandable that the date was used wherever possible. The date palm is also mentioned in many classical sources.¹¹⁷ We even learn from Strabo (XVII, 610) that “*The best dates of all grow in Thebes, ... the Theban date is firmer, but tastes better.*” And Pliny, names five varieties.¹¹⁸

Perhaps this wide range of use is the reason for its frequent occurrence in ancient Egyptian medicinal preparations.¹¹⁹ It was a laxative (Eb13: *bnj w3d*, Eb19 – *bnj tf* /N33, Eb22), used for constipation (Eb28 - *jrp nw bnj*), *mr:t*-disease at one side (Eb40 – *bnjjw*), for *srf.t*-inflammation (Eb93 – *dkw n bnj*),

116 KEIMER 1927, 288-299.

117 E.g. Herodotus I.194, Plinius, NH XIII,26-27, XIV,102. For its medical use see GERMER 2008, 59-64.

118 They are: Syagres / Margarides (round pearl shape, royal, in Babylon), Sandarides (*sandal shaped*), Karyotides (especially suitable for making wine, a finer type, hazelnut-like dates), Nikolaes (large, but less succulent), Adelphides („*brothers*”), Patetes (they burst on the tree due to the high juice content, so they look „*trampled*”), and Daktyles (long, thin like fingers, also called Jewish: Chydees) varieties.

119 GERMER 2008, 59-64; DEINES – GRAPOW 1959, 172-179.

wh3w-rash (Eb92 – *srm.t*, Eb94 – *jny.t n.t bnj*, Eb103 – *dkw n bnj*), *whdw*-pain (Eb98, Eb100 – *wd^c n bnj* and *jny.t¹²⁰ n.t bnj*, Eb103 – *dkw n bnj*, Eb186), for the rectum (Eb133=Eb148 – *dkw n bnj*, Eb154 – *bnj r^m*, Eb163 – *dkw n bnj*), for *t3w*-fever on the lower body, (Eb177 – and *srm.t*), for the *r3-jb* (Eb188 – *ny.t n.t bnj*, Eb189 – *ny.t n.t bnj*, Eb199 – *ny.t n.t bnj*, Eb206 – *ny.t n.t bnj*), the *mr.t-jb* (Eb217 – *dkw n bnj*), the *h3tf*-heart system (Eb220 – *bnj w3d*, Eb224 – *bnj w3d*), for the urine (Eb261 – *bnj*, Eb263 – *bnrj*), for cough (Eb308 – *dkw n bnj*, Eb309 – *bnj r^{3g}* Eb311 – *ny.t n.t bnj*, Eb313 – *dkw n bnj*, Eb317– *srm.t*, Eb319 – *dkw n bnj*), for *ghw* disease (Eb333 – *sb3ldw3 n bnj*), against tapeworm (*hf3.t*, Eb54 – *srm.t*, Eb55 – *jny.t n.t bnj*, Eb65 – *bnj tp mw.t=f*, Eb71 – *bnj w3d*), against roundworm (*pnd*, Eb83 – *r^m n bnj*), against *r^{3c}* (Eb169 – *dkw n bnj*, and *srm.t*, Eb224 – *bnj w3d*), and to cause the *jb*-heart to receive bread (Eb285 – *dkw n bnj*, Eb292 – *wd^c n bnj*, Eb293 – *wd^c n bnj*).

As the drink *bnjw*, it was used by rubbing for swelling, stiffness, “*blood-eating*”, specifically leg swelling, treatment of lameness, softening of knees, and to encourage the “*stripe of a blow*” to fade. Among gynaecological recipes, it is also mentioned as an incense (Kah20), but in most cases, it is intended for internal use.

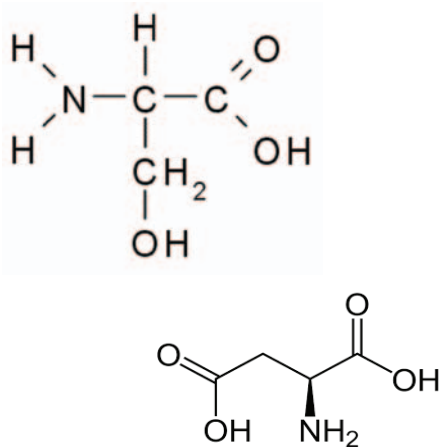


Figure 7. Unripe dates (source: publicdomainpictures.net) and the molecular structure of aspartic acid and serine (<https://www.differencebetween.com/what-is-the-difference-between-serine-and-threonine/>)

Seeds and flesh were thus also applied,¹²¹ and parts that we cannot

120 The classifier indicates that it is small-grained, probably the date stone was crushed or ground.

121 ground (*dkw n bnj* „date flour”, *bnj tf* – ?, with powder classifier), crushed (*bnj r^{3g}* „crushed

yet interpret.¹²² In this recipe there is the *bnj w3d*, which can be translated both *green date* and *fresh date*. The former is more likely by the fact that ancient Egyptians used a “*green oil/fat*” (*mrh.t w3d*, Brl186),¹²³ among the constituents of which, beside a small amount of the unknown *jh_w*-fruit, the same amount of tigernut, water, sorghum? (*mjmj*)¹²⁴ and green/fresh date (*bnj w3d*) were used. The colour of the flour of tiger nut is white, the pure water is transparent, *jh_w* is unlikely to be the colouring matter, otherwise it would not make sense to name its green colour in a bandage (*jh_w w3d*, Bln16), thus the sorghum(?) or/ and the date could only give the colour. Much later, Dioscurides also describes the unripe dates in such a way that he specifically refers to Egypt in connection with the plant: „*The fruit is gathered in the autumn, the ripening time being half over. It is similar to the Arabic myrobalan [1.40, 4.160] and it is called poma. It is a green colour, and similar to quince [cydonium, 1.160] in smell, but if it is left alone until it comes to the full ripeness it becomes dates.*” (tr. OSBALDESTON, 2000) The green date was used in New Kingdom recipes dealing with specifically the *metu*-system, when regulating the fluids and/or the temperature, concentrating mainly the *h3tj*-heart system, rectum and urine.¹²⁵

From a magical point of view, its effectiveness was completely supported by the fact that it was the sacred tree of the sun god Ra – according to the Horus myth of Edfu, since the time when the front part of Ra’s bark was made of it. In ancient Egypt, many other mythological and religious images were connected to it,¹²⁶ in the cult of the dead,¹²⁷ the cult of the gods, or the royal

date”), pressed (*t bnj* – „*date bread*”, *srm.t* – „*date pulp*”), left whole (*tmm n bnj* „*whole date*”) and chopped (*wd^c n bnj* – „*chopped date*”), dried (*bnj s_w* „*dry date*”) or fresh or even unripe (*bnj tp mw.t* – „*date on the mother*” – still growing on the tree?), fermented (*hpr dsf n bnj* „*self-fermented date*”), cooked or macerated, or even as a liquid (*jrp nw bnj* „*date wine*”, *bnjw* „*date juice*”, *srm.t* „*date drink*”, syrup?) – not only its flesh, but also its seeds (*jny.t n.t bnj*).

122 *sb3/dw3 n bnj*, *sm^c n bnj*, *bnj tp mw.t=f*.

123 As no oil/fat is added to the mixture, the oily consistency can only be the result of the high oil content of tiger nuts.

124 The plant is a staple food, produced mainly at the harim fields according to HELCK 1965, 803, translated by Gardiner and Grapow as emmer (DEINES – GRAPOW 1959, 220-223), which is rejected by GERMER (1979, 278-280). Grapow mentions that Lefévre suggested the identification with sorghum, which is also rejected by Germer with the reason, that sorghum is not attested in Egypt. In VARTAVAN ET ALII (2010, 221-222), however, even several species are listed, from late Paleolithic times to Ottoman period, thus we assume this as a possible translation.

125 It occurred in Eb13, Eb71, Eb220, Eb224, Eb266, Eb272, Eb283, Eb641, Eb856c, Brl163c, Brl186, Bt14, Bt16, Bt18, Bt20, Bt23, MuK H – are all clearly connected to the *mtw*-system, only Eb746 is standing apart with the *bnw* on the teeth and the letting grow the flesh there.

126 GAMER-WALLERT 1962: 98-103.

127 E.g. RANKE 1931, 587-591: relief in Heidelberg, where the mortuary sacrifice is presented

ritual. In the Coffin Texts Sp. 325, for example, the eye of Ra-Atum appeared in the form of an uraeus serpent in the date tree, and the Osiris-tombs of the Late Period were surrounded by groves of date palms that “grew” (*rwd*) from the god’s “sap” (*rwdw.w*).¹²⁸ That is why the palm (branch) could become a symbol of immortality.¹²⁹ We also know that the “lake of life” spread west of the Philae date palm grove. Next to this was the “house of dates” (*pr-bnj.w*), where Anubis washed the corpse of Osiris.¹³⁰ Date palm also found a place in the cult of the ruler, as the king made a pilgrimage to the palm groves of Buto and Sais in order to legitimize his reign.¹³¹

Dates contain many active ingredients that support their medicinal use. Due to the high sugar content (70%), it has a stimulant-reducing and expectorant effect, which is very effective for coughs; at the same time, due to the many carbohydrates and proteins, the nutrient content is high, and the variety of minerals, vitamin A and especially vitamin C, accelerates healing. Its laxative effect applies to stomach treatments. It has some amino acids,¹³² such as aspartic and glutamic acid, threonine, serine, proline, glycine, and alanine, among others. It also has antibacterial effects against several microorganism. The active ingredients of green dates, the many astringent tannins, acted as a stomachic and anthelmintic, and when applied externally, its astringent compounds can also have a favourable effect on the healing of boils.

ss(n)n / LOTUS (*NYMPHAEA CAERULEA*) 

The blue and white lotus, native plants along the Nile and in North Africa, are herbs belonging to the fairy rose family that contains psychoactive alkaloids.¹³³ Since ancient times, the lotus flowers, in Egypt especially the blue lotus, have been used for fragrances, perfumes and medicine. The lotus flower was steeped in tea or alcohol and used as an incense in several cultures, for

under the date palm.

128 E.g. Philae: JUNKER 1913, 18-21, VANDIER 1961, VIII.21. – PANTALACCI 1981, 59.

129 Apuleius, *Métamorphosis* XI.– FICK 1971, 336-337.

130 pJumilhac, XI.25-XII.1. – PANTALACCI 1981, 59-66.

131 GAMER-WALLERT 1962, 128; SETTGAST 1963, 51, and 68, no. 3-5 and 69, figs. 8-11.

132 KURAS ET ALII 2020.

133 It is mentioned in Greek literature already by Homer (*Od.* IX 82-104): The envoys of Odysseus, after eating its sweet fruit, abandoned their task and remained there, and could only be returned to the ship by force – this event is explained by the plant’s ability to bring oblivion, which was also confirmed by folk etymology based on the Greek language (SCHENKEL 1998). But the Lotus eater in Homer is not accepted by everybody to be the eater of the *Nymphaea*, as there is also the *Zyziphus lotus*, the fruit of which can also be called just lotus.

instance in India or, in South America, the Maya culture.¹³⁴ Nowadays, it is also used in various cosmetic products, massage oils and creams, as well as in incense sticks and hand pipes.¹³⁵



Figure 8a. Blue lotus (left) and white lotus (right) in the fishing scene of the tomb of Kagemni in Saqqara (Photo by H. Györy) and 8b. white lotus in nature (source: Wikipedia)

Both the white and blue lotus were widespread in Egypt, and depicted often in their natural surroundings, often having symbolic values, especially concerning the creation of the world, as in the wide spread solar cosmogony, it emerged from the primeval water, hiding the sun god in its flower, and the plant repeated this appearance each morning.¹³⁶ The shape of the flower, is however, always very characteristically presented (Figure 8). The white one was usually represented in nature, while the blue one occurs often in mythological or symbolic context.

For medicinal use the blue one was chosen. The *Nymphaea caerulea* is a prominent symbol of Egyptian culture. It was depicted together with the figures of gods and other sacred symbols, and was associated with creative power and the Sun as the source of life and rebirth. Among the surviving statuettes, we encounter representations where Horus sits on the lotus flower, or the four Sons of Horus are standing on top of it, or the plant serves as a throne for Isis and Osiris; moreover, the head of Tutankhamun emerged from it as a beautiful statuette in his tomb. The god Nefertum should also be mentioned, who was again depicted as a child sitting on a lotus flower, due to his connection to the ancient creation myth, and Nefertem wore this flower as an attribute on top of his head. Besides being the symbol of the cyclic repetition of primordial life and regeneration, the lotus served also as the symbol of fertility. It was represented in banquet and erotic scenes, as a

134 BERTOL ET ALII 2004, 84-85.

135 There are several homepages dealing with the various aspects of the lotus, e.g. <http://mentalfitnessguru.hu/eletmod/gyogynovenyek/kek-lotusz-misztikus-gyogynoveny/>

136 See in general e.g. STRAUSS 1974, 72. In a poem on p. 80 „*Sekhmet les feuilles du lotus, laret (?) les boutons et Néfertoum, le calice épanoui.*”

hair adornment, offering to be put on the table, in large standing bouquets, or held in the hand by a figure sniffing its fragrance. Its power was also attested by the myth of Ra, when he refreshed himself by its scent.¹³⁷ It also appears in love poems and hymns as a life-giving symbol with all-pervading power.¹³⁸ Different objects were decorated with it or even shaped in its form. Lotiform column capitals indicated its regenerative force,¹³⁹ lotus-shaped lamps the rebirth. Plants were put in elaborate wreaths on mummies, and among the grave goods.¹⁴⁰

In medical texts the *ḥ3w* (Eb209, Eb224, Eb 258, Eb479, H82, Bt13b) or *s3p.t* (Eb108, Eb475, H158, H216) parts of the lotus are applied, although once the *sšn* is attested without any precise details – it was used for curing headaches (Eb258). Both the above words mean the leaves.

The *ḥ3w* is also used with *šsp.t*-plant, thus it might hint at a wide, large leaf, and as the same picture representing the rounded leaf on straight and high stalk above the root system, means a thousand, these leaves could be found in large quantities.¹⁴¹ It was used in prescriptions with very different purposes, typically 1/8 of the amount, and once in 1-unit recipe, which, taking into account the general development of quantity-use in prescriptions, indicates a relatively new development in medical application.

The active ingredient of the fruit and root is nuciferine, which together with aporphine has a calming and slightly euphoric effect. Certain derivatives of aporphine relieve pain, mainly that characteristic of diseases of inflammatory origin. Thus, the plant could be used as a pain reliever – sedative, sleep enhancer, stress and anxiety reliever, as well as an antiseptic – for stomach and intestinal infections. The fruit and root also contained the alkaloid apomorphine, which is a selective D1/D2 dopamine agonist, causing through several actions relaxation of the penile smooth muscle and vasodilatation within the corpora cavernosa, and as a consequence the erection of the phallos.¹⁴²

137 The feature is already attested during the Old Kingdom (see Pyr. 264, 266a).

138 DERCHAIN 1975, 72.

139 https://offforever.blog.hu/2015/09/01/a_lotusz_templom.

140 VARTAVAN ET ALII 2010, 168 – starting with the 18th Dynasty, while the white lotus is attested less often, but from predynastic times (p.168-169).

141 The root of the *s3p.t* is *s3p*: „submerged”, thus it speaks about the leafy herb being in the water. Surprisingly however it can also be connected to the earth (Eb108: *s3p.t-t3*). It is even weirder, that the classifier behind the word here, and in the vomiting agent H216, is the herbal sign M2; furthermore, the word *sšn* is not mentioned next to it, which raises the possibility of another water/waterside plant with a similar shape. Even in Eb475=H158 the lotus leaf is drawn differently as with *ḥ3w*. Its stalk goes obliquely, like the floating leaves of *N. lotus/alba*.

142 BERTOL ET ALII 2004, 84-85.

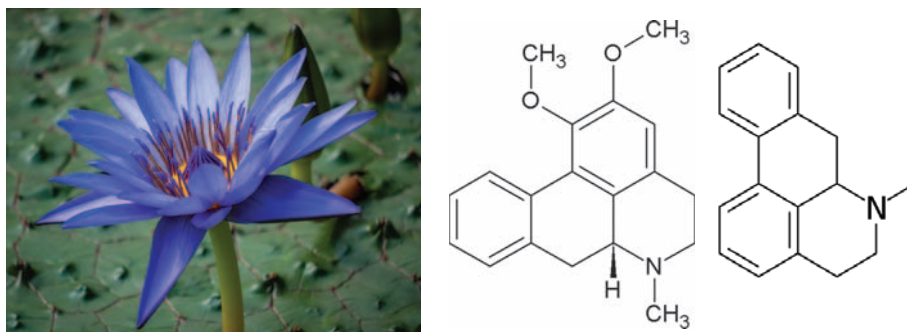


Fig. 9. Blue lotus (source: hu.fwiki-wiki) and chemical structures of nuciferine and aporphine

In the above recipe, we meet the leaves. The water lily leaves have been used in traditional Sudanese medicine as a remedy for dysentery and to treat tumours.¹⁴³ In case of the yellow *N. nuchali* in India, it is eaten by people. The phytochemical constituents of the methanol extract of the leaves of *N. nuchali* was there analysed, and the antimicrobial activity evaluated.¹⁴⁴ The result attested the presence of tannins, flavonoids, saponins, alkaloids, terpenoids, steroids, sugar and protein, and showed high antimicrobial activity against all of the test bacteria and fungi organisms (*Bacillus cereus*, *Bacillus subtilis*, *Staphylococcus aureus*, *Escherichia coli*, *Pseudomonas aureus*, *Pseudomonas aeruginosa*, *Xanthomonas campestris*, *Candida albicans*) by preventing their growth. The nutritious value of *Nymphaea* leaves is also attested.¹⁴⁵

ASSESSMENT

The 3rd disease is one of the unidentified diseases, with the likely possibility, that it is ancylostomiasis. Ancient Egyptians attributed it to Otherworld creatures, including the spirits of dead men and women, thus they could not discover its real cause. As such, the physical treatment could be rationally based only on trial and error experience, and theologically on general divine help. As it was a severe, fatal disease, they needed regenerating power to escape it. The treatment was accordingly based on materials with effective drugs chosen for practical and theological reasons.

143 EL GHAZALI ET ALII 1994, 76.

144 GHOSH ET ALII 2013.

145 Interestingly, in a trial on carp the growth of the fish was only observed with *Nymphaea* leaf up to 40% inclusion level in the food, and the efficiency decreased thereafter, probably because of its protein digestibility value. (SIVANI ET ALII 2013.)

Considering the data we gained from the study of the materials, we can assume that the main aim expected by ancient Egyptian doctors was to strengthen the body (*w^ḥ*), alleviate the *metu*-system (*k3k3*), expel the harmful ʕ^ḥ material (*nh.t*), regulate the fluid and temperature of the *metu*-system (*bnj*) and better general feeling (*sšnn*).

material	rational effect clinically assured	rational effect expected by the ancient Egyptians	irrational effect
<i>w^ḥ</i> / tiger nut (<i>Cyperus esculentus</i> L./ <i>Cyperaceae</i>)	strengthens the body, roborating	support the belly and <i>jb</i> functions, nutrient	pleasant for the gods served to win them over
<i>k3k3</i>	?	alleviate the <i>metu</i> - system	a life assuring material, protection
<i>nh.t</i> (<i>Ficus sycomorus</i> Forssk./ <i>Moraceae</i>)	? (unidentified part)	? protecting the <i>metu</i> -system / expelling the ʕ ^ḥ	regeneration, rebirth
<i>bnj w3d</i> / unripe date (<i>Phoenix dactylifera</i> L./ <i>Aracaceae</i>)	stomachic and anthelmintic	regulating the <i>metu</i> - system (fluid, temperature)	immortality, protection of Ra and other powerful gods
<i>sšnn</i> / lotus (<i>Nymphaea</i> <i>caerulea</i> Sav./ <i>Nymphaeaceae</i>)	nutrient, antibacterial and antifungal	good feeling	rebirth and fertility

From the theological side these plants helped the patient effectively, as by them (s)he managed to satisfy the gods with food (*w^ḥ*); the preparation was a life assuring material (*k3k3*), the symbol of rebirth (*nh.t*), which gave the protection of great gods and immortality (*bnj*) through rebirth (*sšnn*), ie. recovery from the disease.

From a modern pharmaceutical viewpoint, we can assess that this mixture was nutrient and roborating (tiger nut), stomachic and anthelmintic (unripe date and lotus). As the part of the sycamore used is unidentified, we can only raise the possibility of an antibacterial, mild laxative effect, which is attested in several parts of the sycamore. With the *k3k3*, it is hazard a guess.

CONCLUSION

It is confirmed by the Ebers papyrus found in a tomb in ancient Thebes, that Egyptian physicians there collected more than 800 prescriptions and used more than 500 herbs. Many of them are still unidentified, and several of them were misidentified, but used so still now. We only know the ancient Egyptian names of about 30 medical plants with absolute certainty. Some other plants are tentatively identified, or there are several plants where several possibilities arise. In these cases, the ancient use can be compared to ethnobotanical observations and in some cases, the modern use can also be checked, and indeed they are often plants which can be positively tested in a clinical setting. It is understandable that ancient Egyptian doctors were recognized in antiquity, since the effectiveness of their medicines can still in many cases be demonstrated today. In the article we have given examples for these cases.

On the other hand, we know that religious-magical concepts were also linked to the concept of ancient body-system and to medical materials, and plants were no exceptions. We tried to follow also this line by some concrete examples and to approach the healing process parallel on a mythic-theological and rational basis. Phytomythology is a still less researched area of ancient Egyptian religion, but as our examples show, it influenced the mentality of the time, so it also played a role in the compilation of recipes. Thus, we would modify the medieval aphorism „*Medicus curat, natura sanat*”¹⁴⁶ instead of its further developed form “*Medicus curat, natura sanat, Deus salvat*” (*Doctor cares, nature heals, God saves*) into *Medicus curat, Dei sanant*, as ancient Egyptian doctors asked for the beneficent assistance of gods at each step in the treatment.

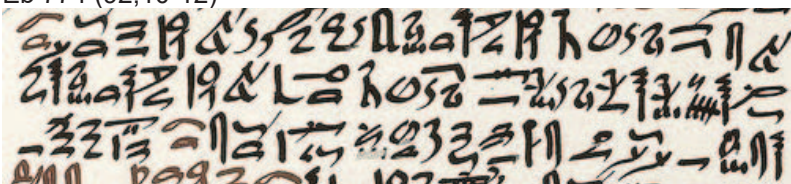
The Alexandrian medical school, established by the Ptolemies, transmitted and developed ancient Egyptian knowledge, which resulted in its partial survival in classical medicine. Thus, its results were mediated, now without the religious background, via European Mediaeval and Arabic literature into academic medicine and also into folk medicine. The invaluable heritage of ancient Egypt fascinates us even today and gives impetus to further development not only on a cultural level, but also in medical research.

146 The ancient aphorism originates from the Corpus Hippocraticum: Epidemy 6,5,1. „*Nature is doctor of diseases*”, which reached medieval Europe through the extended explanation by Galen (Riha, Ortrun, *Mikrokosmos Mensch: Der Naturbegriff in der mittelalterlichen Medizin*. In: Dilg, Peter (ed.), *Natur im Mittelalter: Konzeptionen – Erfahrungen – Wirkungen*. Akademie Verlag, Berlin 2003, 111-123.).

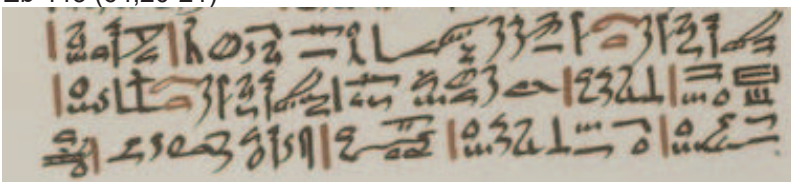
ANNEX

hieratic texts of the prescriptions analysed

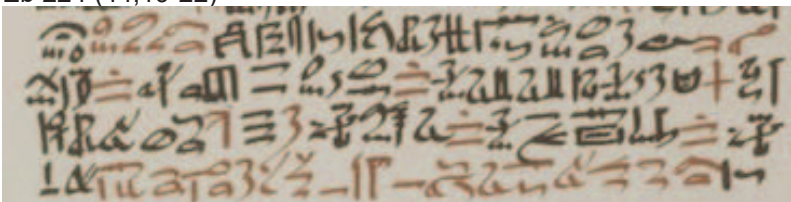
Eb 774 (92,10-12)



Eb 443 (64,20-21)



Eb 224 (44,19-22)



ABBREVIATIONS

Dr. Duke's Phytochemical and Ethnobotanical Databases = <https://phytochemical.usda.gov/phytochem>

Wb = Erman, Adolf – Grapow, Hermann, Wörterbuch der ägyptischen Sprache I-VI. Berlin: Akademie Verlag 1926-1961.

TLA = Thesaurus Linguae Aegyptiae (<https://aew.bbaw.de/tla/servlet/BwlSearch?u=guest&f=0&l=0>)

KRI = Kitchen, Kenneth A., Ramesside Inscriptions, Historical and Biographical II. Wallesey: Abercromby Press 2016.

Dioscorides = See OSBALDESTON 2000.

Brk = Brooklyn ophiological papyrus

Brl = Berlin medical papyrus

Eb = Ebers papyrus

H = Hearst papyrus

L = London medical papyrus

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