Zootherapy in Egypt during Graeco-Roman Period: An Analytical Study of Medical Prescriptions in Papyri and Ostraca
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Abstract
Zootherapy is the healing of human diseases by using of therapeutics obtained or derived from animals. In ancient Egypt, animals and the products derived from different organs of their bodies had constituted part of the inventory of medical substances used to cure many diseases. According to the medical Greek and Demotic papyri and ostraca of Graeco-Roman Egypt, different categories of animals like mammals, reptiles, birds, fish, and amphibians were widely used for healing. Many animal extracts were used like gall, fat, dung, milk, and blood as remedies for snakebite, headache, eye diseases, earache, burns, and wounds.

Key words: Zootherapy, healing, medical, papyri, ostraca, extract, disease, remedy

Introduction
Researching health, that was a constant concern in the life of the ancient Egyptians, we approach several aspects of life in Egypt, archaeology, religion, and written sources of social daily life. The knowledge of the medical practice in ancient Egypt may be derived from human remains, from painted and sculptured artistic depictions of bodies showing physical deformities, traumas or diseases, and from occasional references to diseases in the non-medical papyri (Veiga, 2009). However, the most important sources of our knowledge are the medical papyri that include many detailed prescriptions for different diseases using plants, minerals and animals. In ancient Egypt, there was an intensive use of animals and their products, primarily, they were consumed as food, in addition, tools were made out of animal bones and teeth, and clothes out of animal skin and fur (Veiga, 2009). One of the most important aspects of using animals in ancient Egypt was for religious purposes, since many animals had been considered sacred to specific deities, and worshipped in many temples and sanctuaries. Moreover, animals and the products derived from different organs of their bodies had constituted part of the inventory of medical substances used to cure many diseases. The recent word of the healing of human diseases by using of therapeutics obtained or derived from animals is zootherapy.

Sources
It is important to mention that most of the medical papyri are magical-medical texts, containing incantations and magic spells, and these are not included in this research which is concerned only with the medical papyri that contain animal remedies for diseases. Many medical papyri are dated back to the Pharaonic period, include the uses of animal products or organs for healing many diseases. (Table 1) Moreover, there are many remedies written on postsherd or flakes of white limestone, dated back to the Pharaonic period. For Example, Ostracon 3255 (PL.I), dated back to the 18th and 19th dynasties, displayed in Louvre Museum, contains many medical prescriptions, among them:
"A treatment for earache using doe's horn finely ground, and fumigates the ear with it".
"Another prescription includes crocodile dung, frogs' spawn, fumigate the ear with it".
"Another remedy using tortoise shell and fumigate the ear with it" (Mudry, 2006)
During the Graeco-Roman period, the same attitude of healing diseases with animal extracts or organs had continued. Many medical papyri and ostraca had been discovered in many places in Egypt, especially Fayum, and Oxyrhynchus, including many medical prescriptions for various diseases with animal ingredients.

1- Papyrus Rubensohn 10456 (Pl. II)
It had been found by Otto Rubensohn in the temple archive of Elephantine in 1906, dated back to the fourth century B.C. (the beginning of the Ptolemaic period), and is now displayed in the Egyptian Museum in Berlin (Westendorf, 1999), the right part of the papyrus is lost, but many medical prescriptions are still clear as follows:

**Prescription III- IV, for treating cough**
"Flour of wheat 1/4, flour of barley 1/4, flour of dates 1/8, gengenet 1/8 (kind of plant), goose fat 1/2, gum-resin 1/4, to be cooked, to be exposed to dew in night, to be taken therefore, and put on it gengenet, and goose fat 1/8, and honey 1/8, to be drunk for four days, in finger's warmth".

**Prescription X-XIII, remedy for a man who is suffering from cough, his voice being hoarse**
"Dates 1/32, shenfet (grain), {……} Fat, as they are fresh, to be taken and a portion to be chewed in finger's warmth".

**Prescription X-XV, for treating heat**
"{……} of the flesh of a bull and the tripe of the bull, then he who is suffering from heat shall drink it" (Westendorf, 1999).

**Prescription X-XVI**
"Milk 25 ro, colocynths 1/64 ro, cumin 1/64 ro, goose fat 1/8 ro, sweet beer 25 ro, honey 1/16 ro, to be cooked, to be mashed, to be drunk for 4 days".

**Prescription XVII**
"Flesh of ox, brain of ox, to be drunk" (Westendorf, 1999).

2-Papyrus Brooklyn 47.218.48 and 85 (upper and lower halves of the roll) (PL.III) A-B
This remarkable papyrus is dated back to the fourth century B.C., known also as Brooklyn medical papyrus, found in the Sanatorium of Heliopolis (Tell Hisn), and now in Brooklyn Museum in New York.

It is concerned with ophiology or the study of the reptiles and amphibians, the first half (A) includes description of a number of different snakes, and the second half (B) displays different treatments of snakebites, scorpionbites, and spiderbites (Westendorf, 1999).

**Prescriptions for snakebite**
**Line 43 a / b**
"Baboon hair 1/8 ro (14-15 mls), with caraway (tpnn) 1/8 ro, honey 1/8 ro, beer 10 ro, all cooked together and to be drunk" (Westendorf, 1999).

**Line 46 a**
"sd-pnw (kind of plant) 1/32 ro , old bread 1/64 ro , gall of red goat 1/32 ro , beer 15 ro , barley flour 1/32 ro , cooked together and to be drunk for 4 days " (Westendorf,1999).

**Line 46 e**
"Grain flour 1/32 ro, resin 1/32 ro, gall of goat, wine 15 ro, to be drunk".

**Line 46 i**
"Dung of yellow ox, water".

**Line 47 c**
"Dung of red ox 16 ro, gall of red ox 1/32 ro, wine 15 ro, to be drunk for day long.

**Line 47 e**
"Fat of ox, fresh sauer milk, used as bandage over the wound for one day" (Westendorf, 1999).

**Lines 51 a - 52, a remedy for the bite of viper**
"Salt, oil, spawn of fish, mineral, used as bandage".

**Line 54 d**
"Fruit qpw 1/4 ro, dung of red ox 1/16 ro, heart of a deer 1/16 ro, dung of sea animal 1/28 ro, wine 10 ro, to be drunk for long time ".
"qpw fruit, dung of black ox, water, to be drunk ".

**Line 58**
"Natron, fat of red goat, barley flour, used as bandage for one day" (Westendorf, 1999).

**Line 69**
"Goat milk 25 ro, cooked with honey 1/4 ro, to be drunk warm ".

**Line 70**
"Blood of small goat 1/8 ro, honey 1/4 ro, beer 64 ro, to be drunk ".

**Line 72 b**
"Sauer milk, salt, lung of ox 1/16 ro, vinegar 1/16 ro, beer 10 ro, to be drunk for one day, and on the next day another prescription should be taken includes " Water of a cow, fat from the back of a bull " (Westendorf,1999).

**Line 78 a**
"Shell of turtle to be cooked, fat of hippopotamus, oil" (Westendorf, 1999).

**Line 85 a**
"Snail, fish (Tilapia Nilotica) used as bandage" (Westendorf, 1999).

**Line 87 b**
"Dung of donkey, gum, red ochre, dried together".
Line 89
"Dung of a turtle, extract of fruit, used as bandage" (Westendorf, 1999).

Line 90 c
"Blood of a cat, blood of sea animal, blood of cobra, dung of crocodile of necropolis, amber, used as bandage".

Line 95 a
"Foot of a hawk ……” (Westendorf, 1999).

3-Demotic Berlin Papyrus 13602
Although, there are several late medical papyri written in Demotic, they were influenced by Greek thought. This papyrus, which contains prescriptions for preventing pregnancy, was found in Gebel Abusir el-Meleq in Fayyum, dated back to the first century B.C., and is now in the Egyptian Museum, Berlin.

Line 3-4, a prescription for preventing pregnancy
"Using kind of fish (Labeo Niloticus) with………,in the vulva of a woman" (Halioua, 2005).

4- Tebtunis Papyrus 273
This papyrus had been found in 1899-1900 at Um El-Buragat (old Tebtunis), in the southern part of Fayyum, dated back to the early part of the first century B.C.

Col 2, Prescription for wounds
"Cause the wound to open, bandage of ………., cow fat 1/6 kite (equals deben=91 grams), apply on it" (Tait, 1977).

5-Demotic Papyrus of Vienna 6257 (Pl.IV)
This papyrus is dated back to the second half of the second century A.D. (Roman Period), and also called "The Medical Book of Crocodilopolis" (Vindob, 1976).

Line IX, 25-26, A prescription for drying up the putrefaction in the ear
"Mouse's dung, hot wine, to be applied to it"

Line X 16, A prescription for headache
"The skull of a catfish with oil, anoint the head"

Line X 20-21, A prescription for blindness
"Mash the eye of a pig with honey, red ochre"

Line XII ,12-13, A prescription for Cataracts of the eye
"Mix brain of tortoise with honey, place on the eye" (Vindob, 1976).

Line XVI, 14-18, A prescription for ……… (not mentioned)
"Blood of goat used as ointment"

A prescription for baldness
"Crush toes of a dog, date pits, hoof of a donkey, mix with goose fat and apply"
A cure for burns
"A mixture of milk of a woman who has borne a male child, gum, and ram's hair"

A prescription for a head gash
"Egg of an ostrich dried to a powder and mixed with grease"

Another prescription for headache
"Bandages of baby crocodiles over the head" (Vindob, 1976).

6-Papyrus Oxyrhynchus II 234
It is a fragment of a treatise on medical prescriptions, written in Greek, discovered in Oxyrhynchus in 1897, and dated back to the third century A.D., probably to the reign of either Antoninus, Marcus Aurelius, or Septimus Severus, and now displayed in the University of St Andrews, Scotland (Hunt, 1911).

A prescription for earache
"Some gum with balsam of lilies, honey, rose-extract, twist wool with the oil in it, warm and drop in"

Another
"Thoroughly moisten a flock of wool with the gall of an ox, roll up and insert"

Another
"Syringe with gall of bull or goat or sheep, or other similar kind of gall, warmed" (Hunt, 1911).

7-P.Mich.Inv.21 (PL.V)
This papyrus was purchased in Egypt in 1920, and is of unknown provenance, dated back to the fourth century A.D., and composed of thirteen fragments that were commissioned by a physician. These fragments contain medical recipes for plasters or poultices to be applied to wounds, ulcers of various kinds, herpes, and surgical incisions (Youtie, 1986).

P.Mich.Inv.21 A
Line 5-6
"For the affected parts of the body are healed by the application of the so-called "parygon" (pig fat mixed with medicaments), 44 drachms of fresh swine fat, 24 drachms of white wax, 6 dr. of
white lead, 6 dr. of litharge, the melted soluble ingredients are combined with the powdered dry ingredients, and in time, the medication will take on consistency" (Youtie, 1986).

P.Mich.Inv.21 B
Line 9
"It is effective against ulcers resulting from the surgical incision, 1 oz. of pitch, 3 oz. each of wax and oesypum (grease of sheep's wool)" (Youtie, 1986).

P.Mich.Inv.21 B verso
"It is a treatment for wounds, 12 dr. of calamine, 8 dr. of burnt river crabs, 5 dr. of white lead, 16 dr. of wax" (Youtie, 1986).
Besides previous medical papyri, there are little broken medical ostraca from the Graeco-Roman period. Inspite of their few number, they give evidence of the use of animal for healing with similar repeated ingredients, as if they were copies of each other, that's why, I mentioned here only one example.

Demotic ostracon Berlin 5570
This ostracon is dated back to the Roman period, including six medical formulas for ointments like: "Sauer milk, another prescription ox fat" (Westendorf, 1999).

Analytical study (Table II)
According to the previous medical prescriptions, it is obvious that the animals were basic ingredients in them.

A- Categories of Animals
A1- Mammals
Mammals are warm-blooded animals, including humans, characterized by giving birth of young and milk-producing for nourishing it (Mifflin, 2000). It is clear in Table II, that the mammals and their extracts, constitute the greatest part among the animal ingredients in the medical papyri. Like the goats, which were common in ancient Egypt, raised for their meat, skin, and milk, and were also used as a sacrificial animal, according to Herodotus, goats were the preferred sacrifice at Thebes.
The sheep was the source of wool, butter, cheese and milk. Evidence for some restrictions on sheep consumption is recorded by ancient historians like Plutarch who reported that the Egyptian priests didn't eat its flesh (Brewer, 2001).
Beside goat and sheep, there were also cow, bull, ox, which were all sources of meat, fat, and milk. As for pigs, they were also common food in ancient Egypt, although it was long thought, by Egyptologists, that they were a taboo meat, Herodotus was responsible for that belief, since he reported that the Egyptians never touched pigs or ate them because they were identified with Seth (Veiga, 2009).
Some other mammals are included in medical remedies like baboon, deer, hippo, donkey, cat, mouse, dog, and ram.

A 2- Birds
Many birds are mentioned in the medical prescriptions like goose, ostrich, and hawk.
A 3- Fish
Fish was part of daily diet of ancient Egyptians, although it was considered impure by some priests. According to Herodotus, it was not permitted to priests to taste fish. There were many kinds of fish, like "Labeo Niloticus", which was forbidden to be eaten, because it had a connection with the Osiris death myth referencing his lost phallus in the river, eaten by this fish that was identified with Seth (Rosalie, 2002).

I think that this is the reason for using specifically this kind of fish to be inserted into the woman's vulva acting as a natural contraceptive that attacks the sperm (coming out of the phallus that was eaten by it) and destroy them to prevent pregnancy.

In an article published in Harvard Magazine, the author mentioned that the ancient Egyptians treated migraines with electrical discharges from the catfish. Doctors in ancient Egypt also used these native fish from the Nile with electrical properties to treat articulations and therefore reduce pain from arthritis (Harvard Magazine, 2005). The Roman doctor Scribonius Largus wrote that the migraines and other pains could be cured by standing still on shallow waters near these electrical fish, and this explains the using of the catfish to cure headache (Veiga, 2009).

A 4- Reptiles
Some of the reptiles like cobra was used in medical prescriptions. According to recent studies, snake blood has anti-inflammatory effects, thus is beneficial in treating inflammatory disorders, that's why it was used against snakebite. As for the crocodile, it is also mentioned in the medical prescriptions for healing snakebite and headache, although the using of the dung of necropolis crocodile is not understood (Majno, 2003).

A 5-Amphibians and Crustacean
Like turtle, tortoise and river crabs.

B-Extracts or Organs
B 1- Fat
The most common ingredient in medical prescriptions, was obtained from many birds like goose, and animals like bull, ox, goat, hippo, and pig. Probably because of its thick texture, it was used as a binding medium (Lucas, 1962).

B 2-Gall
The gall is the contents of the gall bladder, extracted from many animals like bull, goat, ox, and sheep.

B 3-Milk
Milk was used in many medical prescriptions either fresh milk or sauer milk. There were two sources for milk, animal source from mammals like goats, and human source from woman who had given birth especially to a boy, as it was believed that it had a special healing power.

In many museums, there are many human milk containers designed for child nutrition, had lids in the shape of woman's head and a female body with breasts (Poole, 2001).

B 4-Dung
One of the strangest ingredients used by the ancient Egyptians for healing was the dung of animals, the recent scientific researches discovered that the dung contains anti-bodies similar to
penicillin, thus the use of the dung was a very excellent natural healing tool against different diseases (Veiga, 2009).

**B 5-Blood**
The blood of many animals was used like the blood of the goat, and the blood of a sea animal, cat, and cobra.

**B 6 – Miscellaneous**
Many other animal extracts or organs were used like ostrich egg for healing head gash probably because the ostrich egg is characterized by its hardness resembling the skull. Beside the animal flesh, brain, tripe, lung, hair, spawn, heart, shell, hoof, foot, eye, toes, and wool.

**C-Diseases**
The medical prescriptions were used internally or externally to heal various diseases (Raj, 2006)

**C1- Internal uses for:**
- General pain (earache – headache)
- Cough
- Heat
- Eye diseases (Cataracts- blindness)
- Preventing pregnancy

**C2-External uses (ointments – bandages) for:**
- Burns
- Baldness
- Snakebite
- Wounds

**Conclusion**
Animals and their organs were widely used for healing during Graeco-Roman period. The mammals constituted, with their organs and extracts, the most common ingredient. Most of the prescriptions are almost similar, as if they were copies of each other, probably because the prescriptions that proved their efficiency continued to be used for decades. I could understand the reasons of using some ingredients, depending on the recent scientific researches, while some others are weird and hard to explain (Ex. The baby crocodiles for headache).

The attitude of using animals for healing is still continuous in Egypt in the 21st century through the folk medicine that is well practiced by some Egyptian people, especially the peasants in villages.

I think that we can use this heritage of medical papyri to promote therapeutic tourism by reusing the old hospitals or sanatoriums in the Egyptian temples of the Graeco-Roman period, like Dendara, where sick people used to go, to revive the practicing of the folk medicine in ancient Egypt.

It is important for the tour guides to know that animals in ancient Egypt were not only worshipped but also used for healing different diseases.
References
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Tait, W.J. (1977), Papyri from Tebtunis in Egyptian and in Greek, London.

Tables and figures

Table I: The most Important Medical Papyri in Pharaonic Period using Animal Products / Organs

<table>
<thead>
<tr>
<th>Title</th>
<th>Location</th>
<th>Date</th>
<th>Paragraph No.</th>
<th>Animal extract / organ</th>
<th>Disease</th>
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<tbody>
<tr>
<td>Kahun</td>
<td>University Coll.London</td>
<td>1820 B.C.</td>
<td>P.21-22</td>
<td>Crocodile / Excrement</td>
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<td></td>
<td>Bib,Westendorf W., 1999</td>
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<td>Cow / Milk</td>
<td>To cure falling of womb</td>
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<tr>
<td>Ebers</td>
<td>Leipzig</td>
<td>1500 B.C.</td>
<td>P.765</td>
<td>Goose / fat</td>
<td>To cure ear that emits a fetid humor</td>
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<td>P.766</td>
<td>Shrewmouse / head</td>
<td>Against dryness of wounds</td>
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<td>Goat / stomach</td>
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<td>Tortoise / shell</td>
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<tr>
<td>Source</td>
<td>California</td>
<td>1450 B.C.</td>
<td>Goose / fat</td>
<td>To remove sickness</td>
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<td>W., 1999</td>
<td>P.XI.1-2</td>
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<td>Beetles</td>
<td>To expel bewitchment</td>
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<td>P.X.4-5</td>
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<td>Worms</td>
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<td>P.X.18</td>
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<td>Abydos Fish</td>
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<td>P.VII.4</td>
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<td>Bull / blood</td>
<td>To cause hair to grow</td>
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<td>P.II.5</td>
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<td>Rotten mouse / body</td>
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<td>Greyhound / blood</td>
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<td>Worms</td>
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<td>To prevent white hair</td>
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<td>To remove hair</td>
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<td>Source: Researcher’s work</td>
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Table II: The Analytical Study of the Medical Prescriptions with animal extracts/organs in Graeco-Roman Egypt

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<th>Animal</th>
<th>Extract / Organ</th>
<th>Category</th>
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<td>Birds</td>
<td>Cough</td>
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<td>Baldness</td>
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<td>Flesh, Tripe Fat (black bull ) Gall</td>
<td>Mammals</td>
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<td>Snakebite Earache</td>
<td>Brk.L.72 B P.Oxy. II 234</td>
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<td>(Labeo Niloticus )</td>
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<td>Brk.L.72 b, P.Teb.273, col.2</td>
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<td>Snakebite Wounds</td>
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<td>Turtle</td>
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<td>Brk.L.78 a, Brk.L.89</td>
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<td></td>
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<tr>
<td>Hippopotamus</td>
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<td>Brk.L.85 a</td>
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<tr>
<td>Snail</td>
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<td>Clams</td>
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<td>Brk.L.87 b, P.Vien. 6257</td>
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<td>Hoof</td>
<td>Snakebite Baldness</td>
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<td>Cat</td>
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<td>Brk.L.90 c</td>
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<td>Snakebite</td>
<td>Brk.L.90 c</td>
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<td>Birds</td>
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<td>P.Vien.6257, L.IX,25-26</td>
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<td>Wounds</td>
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Source: Researcher’s work

PL.I Ostracon 3255, Louvre Museum

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After Westendorf W., Handbuch der Altägyptischen Medizin, p. 54
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PL.V.P.Mich.21.A
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الملخص العربي

هو نفط يعنى علاج أمراض البشر باستخدام وصفات مشتقة من الحيوانات، وفي مصر القديمة استخدمت Zootherapy

العديد من المنتجات المشتقة من الأعضاء الحيوانيات لعلاج العديد من الأمراض.

ومن خلال دراسة البرديات والثقافات الطبية في مصر اليونانية الرومانية يقترح استخدام العديد من الحيوانات في هذا المجال مثل الماعز والزواحف والطيور والأسماك وكذلك البرمائيات حيث استخلص منها العديد من المواد مثل الجلوكول والروث والدم لعلاج عضة الثعابين والصداع وأمراض العيون والأذن والحروق والجروح.