THE SYCAMORE IN ANCIENT EGYPT:
TEXTUAL, ICONOGRAPHIC AND ARCHAEOPALYNOLOGICAL THOUGHTS

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ABSTRACT

Sycamore exists in all Egyptian districts of both the Delta and Upper Egypt and also in the oases. In ancient Egypt, it was considered one of the most important and popular fruit-trees. It was specifically regarded as a manifestation of the goddesses Nut, Isis and Hathor. Dr Azza Ezzat in this paper will shed light on the history of the sycamore in ancient Egypt, through textual and iconographic evidence, emphasizing the deep connection between sycamore, the goddess Nut and garden pools. In addition, she will discuss the major religious, economic and social role of the sycamore tree in ancient Egypt. This will be followed by Prof. Dr Mohamed Azzazy’s results concerning his field of study (i.e.: Archaeopalynology), obtained with the cooperation of the Austrian Mission for Archaeological Excavations at modern Tell ’el Dab’a (i.e.: the ancient Avaris, capital of the Hyksos, c. 1640-1530 BC, in the Delta of Lower Egypt), in order to study the samples of sycamore pollen that have been found there. Several possibilities for the obtained data will be discussed from the archaeopalynological point of view. We both kindly dedicate our paper in this Volume, to honour Dr Dr Alicia Maravelia.

KEY WORDS: Ancient Egyptian Flora, Sycamore, Acacia, Trees, Gardens, Pools, Plants, Pollen, Soil Profiles, Archaeopalynology, Avaris, Tell ‘el-Dab’a, Nut.

I. INTRODUCTION.

Gardens were an essential element in private tombs in ancient Egypt. The construction of gardens depended on symmetrical plans. Their layout included essential items that were found in their design. Gardens were surrounded by walls and gates. The gardens surrounding the pool were walled-in as a part of the residence and it also served as giving privacy for the family members.1 Terraces were found in gardens’ layout. They gave the opportunity to the owners to look from the top down on the surrounding countryside. Pools were used as sources of refreshment and coolness. In them they bred fish and birds for food. On the higher banks and around pools grew acacia, sycamore, and palm trees, in which lived all kinds of gaily coloured birds; at the water’s edge were thickets of green papyrus and marshes teeming water fowl.2 Plantation was counted as an important item in the design. There were small flower beds around the pool and pergolas next to the pool provided support for vines. Trees like date–palms, dome–palms, sycamores or figs were planted further from the pool in straight rows, mostly consisting of trees of the same kind.3 The plantings may include orchards where fruit trees were planted in rows sometimes around a pool, vegetable gardens, where they were grown in rectangular plots close to water, or flower gardens to be grown beside and in water and in fields.4

In the ancient world, trees were associated with different gods; the sycamore specifically was regarded as a manifestation of the goddesses Nut, Isis and Hathor, who was even given the title Lady of the Sycamore (Nbt-Nht). The symbolism of sycamore–fig connects it with a resting place for the soul. Specifically the sycamore–fig was sacred to Hathor, provider of nourishment for the deceased, and

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1 Daines, 2008: 18.
3 Evyasaf, 2008: 51.
a sentinel on the eastern horizon. The sycamore tree was known as $\text{nht}$ $\text{nqawt}$, while the unripe fruit is called $\text{kAw}$. $\text{nhtit}$ was one of the sycamore houses of the goddess Hathor.

II. History of the Sycamore in Ancient Egypt.

II.1. Textual Evidence of the Sycamore in Ancient Egypt.

The sycamore was mentioned in many religious and historical Egyptian texts. Such use of it in this context reflects the importance that was granted to its significance. It is obviously seen that the sycamore was usually planted in gardens, surrounding the pools. This can be observed either from the ancient Egyptian scenes or texts. The following examples will present various texts either from tombs, offering basins or from papyri to clarify the meanings and the role of sycamore in connection with pools and ponds. In Pepi’s I Decree, the text refers to the wells, pools and canals:

iw wD.n Hm nfr n ip mrw Sw Sdwt Xnmwt nhwt m niwt mrwy (ip)tn

My Majesty ordered not to count the canals, pools, wells, water pots, sycamore trees in the city of the two pyramids.

In the biography of Harkhuf from the 6th Dynasty, he mentioned that he built his house with a pool surrounded by sycamore trees:

ii.n(.i) min m niwt(.i) hA.n(.i) m spAt(.i) qd.n(.i) pr saH aaAw(.f) SAd.n(.i) S sr(w)d nhwt(.f)

I have come here from my city, I have descended from my Nome, I have built a house, set up (its) doors, I have dug a pool (and I have) planted sycamores.

Another text from the 6th Dynasty from the tomb of Qerery at Akhmim is describing how the tomb owner dug a pool surrounded with sycamore trees:

SAd.n(.i) S n mH 100 Hr mAa.f nb nhwt 10 im.f

I have a pond dug by 100 cubits on each of its side (with) 10 sycamores (respectively) on it.

Samentuser who lived at Thebes during the 11th Dynasty and whose stela is in the Florence Museum and Harkhuf, governor of Upper Egypt, both spoke of their ponds and sycamore—fig trees. Samentuser was so proud for having a pool with sycamore trees as pools were a feature of house gardens about which their owners boasted: «ink nfr $S(w)$ qAi nhwt» (= I am one with beautiful pools and tall sycamores). Another text in the stela of Nwi from Denderah dates back to the 11th Dynasty and bears a similar text with the previous one, preserved now in Cairo Museum (CG 20805 /JE 45600):
In a papyrus (pLondon BM EA 10477) that dates back to the reign of Amunhotep II a text mentioned the sycamore accompanied with pools:16 «xn(n) i.n.i Hr nht nfrt Hr it-ib SA gb(w)» (= I settled on the beautiful sycamore which stands in the grounds of the pool). Ineni (TT81) in the 18th Dynasty speaks of his garden of the West17 where he was being refreshed under its sycamores and admiring its beautiful trees:18

Traversing his western pool (and being) refreshed under his sycamore trees, and looking at his beautiful trees.

Ineni also listed the numbers of trees that were found in his garden. The whole inscription gives the number of trees: 73 sycamores, 31 acacias, 170 palms of one kind, 120 palms of another kind,19 5 fig trees, 2 moringa trees, 12 vines, 5 pomegranate, 16 carob trees, 5 Christ’s thorn trees, 1 argun-palm, 8 willow trees, 10 tamarisk trees, 5 nwn–trees (a kind of acacia), 2 myrtles (Xr-ds ?) and 5 more unidentified trees.20

From the previous texts, one can observe the direct relation between sycamores and pools in ancient Egypt. This connection was also seen on some of the offering tables. Wilkinson mentioned that offering tables were made for the presentation of offerings to the dead, at the jubilee festival and for the worship of the solar god Re<sup>c</sup>. These stepped offering basins represent the pool in a garden. Sometimes they have the word for sycamore–fig written on them (nht), and sometimes a picture of a tree.21 The offering table<sup>22</sup> (CG 1330) shows at each corner of the basin’s rim the word sycamore tree xn(n) i.n.i Hr nht nfrt Hr it-ib SA gb(w).<sup>23</sup> Within this context, Fischer added that the one who bears the title 𓊇𓊋 nfr tawy-S, the keeper of the pool, has to plant sycamore trees on the edges of the pool.24

**II.2. ICONOGRAPHIC EVIDENCE OF THE SYCAMORE IN ANCIENT EGYPT.**

Ichnographically, the relation between sycamore tree and garden pools was obviously seen on the walls of the ancient Egyptian tombs. Gardens existed as early as the 4th Dynasty. Old Kingdom sites that have evidence of gardens are more difficult to find; nevertheless, there is evidence that all of the basic forms and ideas concerning the gardens were recognized at this point. Information about the plants in the gardens comes from the analysis of pollen, seeds, roots, and carbonized and decayed remains found at the excavations. Moreover, there are descriptions of the gardens being planted and pools being dug on the Palermo Stone.25 The following selected examples will focus on the existence of sycamore in connection with the goddess Nut and the pools.26

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16 LAPP, 1997: pl. 54-56.
18 HUGONOT, 1989: 141-42.
21 WILKINSON, 1998: 68.
22 See my paper on pool–staircases in this Volume.
23 FISCHER, 1991: 12, 130.
24 n wn Dsw i, the tomb owner (1542) of the 9th Dynasty at Denderah took this title; see FISCHER, 1968: 150.
26 In ancient times, the sycamore was more abundant than today. Great quantities of dried remains have been found in tombs and many pictorial presentations from: Amunmose (TT 19), User (TT21), Puyemrer (TT 39), Amunemopet (TT 41), Neferhotep (TT 49), Userhât (TT 51), Sobekhotep (TT 63), Ineni (TT 81), Amunemheb (TT 85), Min–Nakht (TT 87), Kenamun
In the tomb of Userhât (TT 106), in Sheikh ‘Abd ‘el-Qurna, Thebes, there is a scene depicted in the transverse chamber, on the north wall, top register. This scene shows the relation between the goddess Nut with the sycamore tree and their connection with the T-shaped pool. On the right-hand side of the scene stands the goddess Nut. She is displayed separated from the sycamore and is shown with the image of a tree on her head. She stands on a platform which is portrayed as a pool of water. In her right hand she holds a vase, from which she provides water for Userhât, his wife and mother. With her left hand she holds a vessel on which loaves, fruits (grapes, figs, a pomegranate and a melon), while resting on top is a floral bouquet. Positioned between the legs of Nut and Userhât and almost resting on the foot of Nut, is a platform or basin. At the top of this stand the souls of Userhât and his wife as a pair of human–he-aded hawks (bA–birds) with human arms and hands. With their hands they scoop up the water and eat from the vessel in front of them. The empty columns above Nut’s head mentioned:

The speech of Nut, the great one, working wonders in her name of the sycamore: I have presented you with this cool water that your heart may be thereby refreshed; this water, which comes from your pool in the necropolis on the west of Thebes. You have received small and tasty food in the fruit which springs from my limbs. Your bA sits in my shade and drinks water to its heart’s content.

In the tomb of Sobekhotep (TT 100), Thonefer (TT 158), Nakht (TT 161), Ipuy (TT 217), Hatiay (TT 324); see e.g.: BARAKAT & ABDEL AZIZ, 2010: 38; BILLING, 2002: 185-279.

27 GARDINER & WEIGALL, 1913: 20.
29 The columns for the inscription, above her head, have not been filled with text. This speech actually comes from the tomb of Paser (TT106). It may have been omitted by the artists because it would come better from a dryad–goddess (like the nymphs of oak trees) than from one in complete human form; cf. DE GARS DAVIES, 1927: 15.
30 The speech actually comes from the tomb of Sobekhotep (TT 100), Thonefer (TT 158), Nakht (TT 161), Ipuy (TT 217), Hatiay (TT 324); see RICE, 2001: 196; GARDINER & WEIGALL, 1913: 22.
diss appears from the sycamore at the corner of a pool, holding out her gifts of fruit and drink. It is both an offering place, as indicated by the T-shaped pools, and a place of nourishment. Accompanying the scene, there is a text from the right side:

\[ Dd \text{ mdw in nht nty Hr qaH iAbty S.f } \]

Recitation by the sycamore tree that is situated to the east corner of its pool.

To the left, the same text was repeated but with its direction modified.

\[ Dd \text{ mdw in nht nty Hr qaH imnty S.f } \]

Recitation by the sycamore tree that is situated to the west corner of its pool.

In the tomb of Thonefer\( ^\text{A} nfr \) at Dra ‘Abu ‘el-Naga, Thebes (TT158), a T-shaped pool is depicted in the main hall of the tomb, that was used here as a basin for drinking. The pool is surrounded with palm trees sometimes for nesting pigeons in addition to other trees and papyrus. The tree–goddess is depicted facing the deceased sitting under a canopy and drinking from the T-shaped pool. Sycamore–fig trees were the home of the sky–goddess, called alternatively Hathor, Nut and Isis. On the eastern horizon of heaven, the Sun emerged between sycamore–figs of turquoise.

The sycamore tree had another role, as nourisher of the deceased. In the tomb of Nebamun (\( \text{Nb Imn} \)), at Thebes, his mud–brick house is depicted with two palm trees towering over them. In front of the house, there lies a rectangular pool which is full of birds and fish, and surrounded by borders of flowers and shady rows of trees. In the fish pond, lotus flowers float on the surface of the water and the black fertile mud surrounding it. The Egyptian portrayal of *Tilapia nilotica* appeared in the pool, as well as other kinds as *Bulti*. The fruit trees include sycamore–figs, date–palms and dome–palms, the dates are shown with different degrees of ripeness. On the right of the pool a goddess (Hathor or Nut) leans out of a tree and offers fruits and drinks to Nebamun (now lost). This part is a reminder that however idyllic and realistic the painting may seem, it does come from a tomb and is part of a larger funerary and religious context. On the left, a sycamore–fig tree speaks and greets Nebamun as the owner of the garden; its words are recorded in hieroglyphics. The pool is shown from above, with three rows of trees arranged around its edges. The waves of the pool were painted with a darker blue pigment; much of this has been lost, like the green on the trees and bushes. Accompanying the scene, there is a text that reads:

\[ Dd \text{ mdw in nht /// n nb S pn } \]

32 EVYASAF, 2008: 30.
33 WILKINSON, 1998: 100-01.
37 WILKINSON, 1994: 3.
38 Nebamun prepared for himself a tomb–chapel of shining white limestone on the opposite side of the river from the Karnak Temple (read more in PARKINSON, 2008).
40 EVYASAF, 2008: 51.
41 BREWER & FRIEDMAN, 1990: 79.
43 MANNICHE, 2006: 8-10. See also HOOPER, 2007; PARKINSON, 2008; MIDDLETON & UPRICHARD, 2008.
Nadine Guilhou (Ed.): Liber Amicorum – Speculum Siderum: Nut Astrophoros. Papers presented to Alicia Maravelia

Recitation by the sycamore tree […] to the owner of this pool.

There is a strong connection between the goddess figure, embodied in the concepts of Hathor, Nut and Isis and the T-shaped pool. The presence of the deceased shown in a garden setting, the goddess figure, most frequently in her role as sycamore tree–goddess, and the T-shaped pool, are elements which combine to form a symbolic union. Various examples of the tree–goddesses were found on papyri, as the Papyrus of Any (Spell 59), where he was depicted kneeling beside a rectangular cistern of water, where it grows a sycamore tree; in the tree appears the goddess Nut pouring out water for him from a vessel with the left hand, and giving him cakes with the right 45 [Figure 1]. In the Papyrus of Nakht (BM EA 10471), Spell 63 A, the deceased is standing with his feet inside a pool filled with water, drinking from it, and the tree–goddess is pouring water for the dead in the area of the pool by using the Hst–vase 46 [Figure 2].

II.3. RELIGIOUS, ECONOMIC AND MEDICAL ROLE OF THE SYCAMORE IN ANCIENT EGYPT.

Due to its religious importance and significance, the sycamore tree was planted on the edges of the pools. It was frequently represented in reliefs and wall paintings of the New Kingdom. The sycamore tree was held sacred by the Egyptians as an element present in the funerary landscape, in the earthly garden setting, and as an attribute of the goddess Hathor. The funerary garden, in which the sycamore grows, visible in Theban tomb paintings, can be viewed as a reflection of an earthly place, soon to be thriving in the future home of the deceased. The tree is linked to the T-shaped pool not only in its role with the goddess figure, but also in its presence growing in groves surrounding the pools of private gardens. A grove of sycamore trees was also present at Hatshepsut’s mortuary temple, surrounding the T-shaped pools. The sycamore tree’s symbolic place at the gates of heaven, wherefrom the solar god Re e came forth at dawn, is relevant when viewing its place in the funerary garden, in which the Sun promotes rejuvenation of the landscape. The elements of the pool and goddess were necessary in the process of regeneration of the spirit of the deceased. Moreover, the tomb of Meket–Re e (11th Dynasty, at Thebes) is the best example of having gardens during this period. The forecourt of his tomb chapel was represented in two models found in his tomb. The garden takes up about two thirds of the space, and consists of seven miniature sycamore–fig trees surrounding a pool. The pools may be intended as a place to put offerings, particularly a libation of water. 47

The sycamore tree was related to romance, due to its manifestation in it of the goddess Hathor, the goddess of love. More specifically it was a trysting tree; it was a place where lovers met. It doesn’t only provide cool, deep shade and seclusion, but actively participated in lovers’ affairs. 48

Economically, it had multiple uses; the wood was used for timber, while leaves were used in Medicine. 49 Its wood was used for a variety of purposes including the manufacture of statues, column bases, sarcophagi, coffins, and boxes. 50 In addition, sycamore–fig coffins have been discovered and they date back to the 12th Dynasty and down through the 26th Dynasty. 51

Medicinally, the ancient Egyptians were quite progressive in their diagnoses and treatments of various illnesses. 52 Their advancements in ancient medical techniques were quite unexpected, consi-

46 Faulkner, 1985: 70.
49 Manniche, 2006: 103.
52 See Bardinet, 1995: 582 (Index).
dering the lack of modern facilities and researching skills. In the Ebers Papyrus, which preserves the most voluminous record of ancient Egyptian Medicine known, the sycamore–fruit is mentioned in treating an illness as:

\[
\text{nt smAa mwyt mr kns zp tpy n mn.s: bit wa, snTr wa, prt snw wa, giw wa, iSf n rtHty wa, xsi n nh t wa.}
\]

For correcting the urine (in the) diseased pubic area (at) the first occurrence of suffering: honey one, terebinth resin, one seed of grass, one cyperus grass, one liquid form a baker, one fruit of sycamore.

III. The archaeopalynologically studied area.

Tell ’el-Dab’a (Avaris), located in the northeastern Nile Delta 8th km North of Markaz Faqus [FIGURE 3], has been known since 1885. The archaeological sites known as Tell contain accumulations of ancient settlement debris. Excavations at the site have been conducted since 1966.54 Tell ’el-Dab’a is connected with the ancient temporary capital Avaris lying below deposits of silt and modern cultivation area. Excavations yielded information about the gradual settling of Asian immigrants in the Delta under the so-called Hyksos (@qAw-#Aswt), foreign rulers who held sway for over a century during the Second Intermediate Period (c. 1650-1550 BC).55 The Hyksos had forged a strong power base in the Northeast Delta, an area of great strategic importance. So this stronghold was well-placed to control the trade routes, by land and by sea with the Near East and the Mediterranean World. The Tell ’el Dab’a site is also identified with the site of Piramesses, the Delta Residence of the 19th Dynasty and the biblical town of Ramses.56

![Map of Lower Egypt showing the site of Avaris (Tell ’el-Dab’a) in the Nile Delta](LEFT). ![The studied soil–profile at the former area](RIGHT).

III.1 Geo–Archaeology.

The studied site is the Hyksos capital city of Avaris, at Tell ’el-Dab’a, on the eastern margin of the Nile Delta. An Austrian team led by Manfred BIETAK and Irene FORSTNER–MÜLLER is excavating

54 See e.g.: BIETAK, 1996.
the area. When Herodotos visited Egypt during the 5th century BC, the branch was still flowing with water as it had been during the 2nd Millennium BC. According to archaeological surveys, the Palaeo–Pelusiac Branch was located close to the city of Avaris. The river lays west of the city, between the modern villages. The main branch seems to be separated into two channels in the north, around the ancient city of Piramessos. The results of T. Herbich’s surveys were used, in order to choose the coring points, also providing a useful first approach to the understanding of the area’s palaeo-topography.

III. 2. MATERIALS AND METHODS.

Soil samples from three metres depth profile 25cm for each were taken for pollen analysis (10 gr each) [FIGURES 4-5]. The samples were collected in April 2010 and taken to the Environmental Studies and Research Institute (ESRI) of the University of Manufiyah, Egypt, where they were analyzed. Three gram subsamples from each were extracted for their fossil pollen, using a monofilament sieving following the method of FÆGRI & IVERSEN. Three gr (a sub–sample) were placed in a boiling thermoplastic tube, mixed with 10 ml KOH (10%), then placed in a boiling water bath for 15 minutes. The samples were sieved through a 100 um aperture. The pollen grains were settled in a monofilament sieve (7 um), and then washed with distilled H₂O. The washings were made up with distilled water and were centrifuged at 3000 rpm for 3 minutes. The liquid was decanted and 10 ml of hydrofluoric acid HF (40%) were added, then put in a boiling water bath overnight, centrifuged and decanted. The pellet was re–suspended in 10% hydrochloric acid HCl to dissolve the residual silico–fluorides, centrifuged and decanted. The pellet was re–suspended in glacial acetic acid, in order to be dehydrated prior to acetolysis, then it was acetolysed according to Moore. The purified samples were mounted on glass slides and counted for their pollen grains (up to 300 grains). Pollen identification routinely used 400X magnification with a 1000X magnification for small and difficult types with reference to the standard keys and with reference to the Herbarium Collection specimens of the ESRI, while pollen and spores nomenclature follows BENNET et al. Light microscope photographs of fossil pollen were taken. The pollen samples difficult to be identified were sent to Professor Sekena AYYAD, to the Botanical Institute of the University of Bergen, Norway, to be rechecked for identification, while pollen terminology follows FÆGRI & IVERSEN.

III. 3. RESULTS.

The relative abundance of fossil pollen grains retrieved from samples of the profile is shown in the next Table and figure [TABLE 1, FIGURE 6]. The data obtained reported that pollen abundances were of the families Pinaceæ, Poaceæ, Moraceæ and Fabaceæ.

61 Andrew, 1984: 139, ¼ 1.
63 Fægri & Iversen, 31975: 295; Hesse et al., 2009: 15-25.
Table 1. Frequencies of pollen types/25 gr of soil at different depths of the area under study.

<table>
<thead>
<tr>
<th>Depth (cm)</th>
<th>Gymnospermæ</th>
<th>Monocotyledonæ</th>
<th>Dicotyledonæ</th>
<th>Chronology</th>
<th>Total Pollen Count</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><em>Pinaceae</em></td>
<td><em>Poaceae</em></td>
<td><em>Moraceae</em></td>
<td><em>Fabaceae</em></td>
<td></td>
</tr>
<tr>
<td>0-25</td>
<td>Pinus</td>
<td>Cereals</td>
<td>Sycamore</td>
<td>Acacia</td>
<td>Broad Bean</td>
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<tr>
<td></td>
<td>—</td>
<td>50</td>
<td>—</td>
<td>10</td>
<td>6</td>
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<tr>
<td>25-50</td>
<td>—</td>
<td>60</td>
<td>—</td>
<td>15</td>
<td>9</td>
</tr>
<tr>
<td>50-75</td>
<td>35</td>
<td>40</td>
<td>6</td>
<td>11</td>
<td>13</td>
</tr>
<tr>
<td>75-100</td>
<td>43</td>
<td>25</td>
<td>9</td>
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<td>12</td>
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<tr>
<td>100-125</td>
<td>26</td>
<td>10</td>
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<td>125-150</td>
<td>4</td>
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<td>175-200</td>
<td>3</td>
<td>48</td>
<td>50</td>
<td>34</td>
<td>62</td>
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<tr>
<td>200-225</td>
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<td>12</td>
<td>81</td>
<td>160</td>
<td>85</td>
<td>64</td>
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<td>275-300</td>
<td>5</td>
<td>34</td>
<td>48</td>
<td>23</td>
<td>42</td>
</tr>
</tbody>
</table>

Figure 6: The various types of pollen detected and studied: (a) *Ficus sycomorus*; (b) *Pinus*; (c) Cereals; (d) *Acacia nilotica*; (e) *Vicia faba*. All magnifications are 1000x; scale bars: 10 um.

The most frequent pollen types were recorded at the layer of the profiles (200-225 cm) dating to the Old Kingdom (2780-2400 BC) with abundances 15, 87, 180, 90 and 75 pollen grains for *Pinus*, Cereals, Sycamore, Acacia and *Vicia faba* (broad bean), respectively, while, the recorded pollen types were of lower abundance at the different layers of the studied soil profile. *Pinus* pollen type represented...
the highest record 43% at a depth of 75-100 cm, corresponding to the Hellenic-Roman and Byzantine Period (332 BC-395 AD), not recorded at the recent layers. **Cereals** pollen type represented the highest record 87% at a depth of 200-225 cm, dating to the Hellenic-Roman and Byzantine Period. **Sycamore** pollen type recorded the highest representation 180 fossil pollen grains at the layer of the profile 200-225 cm, dating from the Old Kingdom, and not recorded at the recent layers of the profile, while **Acacia** pollen type recorded the highest representation 90 grains at the layer of the profile 200-225 cm, dating from the Old Kingdom, and the lowest record 7 grains at the recent layers of the profile, dating from the Hellenic-Roman and Byzantine Period. On the other hand, the **Vicia faba** (broad bean) recorded the highest representation 75 grains at the layer of the profile 200-225 cm, dating from the Old Kingdom, but lowest record 6 grains at the recent layers of the studied soil profile.

### IV. Discussion and Conclusions.

Palynology can contribute significant information relevant to the ancient people’s exploitation of plants. The present study was carried out to investigate the different types of pollen grains retrieved from soil profile samples at different chronological periods at the archaeological site of Tell ‘el-Dab’a (Avaris), in the Nile Delta. Data obtained [Table 1, FIGURE 6] showed clearly that, **Pinus** type recorded a high abundance at the depth of 75-100 cm, corresponding to the Hellenic-Roman and Byzantine Period (332 BC-395 AD), and not recorded at the recent layers. This high representation may reflect higher precipitation, also suggesting the downhill migration of the lower forest, and we conclude that climatic conditions became moist to relatively wet at the area under study during the former era (also according to Schulz), while the absence of the **Pinus** type from the recent layers of the studied profile may be due to the dry conditions of this area at recent times. **Cereals** pollen type recorded high representation at samples retrieved from the depth of 200-225 cm, dating from the Old Kingdom (2780-2400 BC). This high representation of **Cereals** pollen indicates the broad use of **Cereals** like barley and wheat in different food preparations during the Middle and the New Kingdoms and also during the Late Period. In this connection, Louis Grivetti stated that the ancient Egyptians used a cereal-based diet, where barley and wheat were commonly prepared as porridge or bread. SADORI et al. reported that during 2750-2500 BC the archaeobotanical data revealed that **Hordeum** (barley) was the dominant crop detected.

**Sycamore** (**Ficus sycomorus**) pollen type recorded the highest representation at the layer of the soil profile 200-225 cm, dating from the Old Kingdom (2780-2400 BC). This may explain that, the sycamore-fig was carried north to Egypt by 3000 BC, and on to Israel, Lebanon and Cyprus. Early farmers in these regions learned how to induce parthenocarpy in sycamore-figs by gashing them with a knife. According to Galil, gashed figs produce ethylene gas which hastens the ripening process.

**Acacia** pollen type recorded high representation at the layer of the profile 200-225 cm, dating from the Old Kingdom (2780-2400 BC). It was interesting to find acacia pollen type in high abundance: this may indicate that acacia trees were abundant at the study area (Avaris, Nile Delta), throughout the 2nd Millennium BC, and they were being used as a source of fire wood in the vicinity of the ancient Hyksos capital.  

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Finally, *fabaceae* (*Vicia faba*) pollen type (broad bean) was recorded with high abundance, in the samples at a depth of 200-225 cm, dating from the Old Kingdom (2780-2400 BC). The presence of broad bean pollen with this representation may support the use of this crop by ancient Egyptians in their kitchen as food, this explanation being in agreement with AYYAD & KRZYWINSKI. They stated that *Vicia faba* was found during the Old Kingdom with relatively high frequencies and was introduced into agriculture in ancient Egypt during the New Kingdom, but they found fossil pollen of this crop with high concentration from Mendes (the capital of Lower Egypt at c. 3000 BC). Also, we may suppose that *Vicia faba* was being used in the ancient Egyptian society as food for poor people.

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