A study Pollen Content of Ancient Pottery Jars from Two Lower Egypt Tombs of around 3000 Years B

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Abstract

Six samples were collected from inside pottery jars of two ancient tombs at Tell El Roba (Mendes, capital of the 16th district in Lower Egypt, 3000 BC) in the tomb were buried a young girl (Predynastic period, about 3100-2780 BC) was interred. Archaeopalynology resulted fundamental to understand the kind of the offers. Samples revealed that four pollen types are recorded in the goat's tomb: Hordeum (45%), Avena (8%), Triticum (22%) and Vicia faba (25%) types. Twelve pollen grain types, belonging to six plant families (Cyperaceae, Poaceae, Asteraceae, Fabaceae, Apiaceae and Lamiaceae) were found in the young girl tomb jars. Triticum is the more abundant (25%) accompanied by Cyperus, Avena, Hordeum, Triticum, Achillea, Ambrosia, Acacia, Vicia faba, Ammi, Anethum, Coriandrum and Thymus types.

Introduction

Egyptologists have carried out little archaeological investigations and despite the long history of the detailed archaeological investigations in Egypt, the application of pollen analysis to archaeobotanical questions are still limited, Ayyad (1995). Previous studies of ancient agriculture in Egypt have been carried out on the Nile flood and grain production, Hassan (1997). The main source of information is plant material in the form of tomb goods, these tomb goods and pictures give the impression of a varied diet (Ayyad and Krzywinski, 1994). Palynology, which is the study of pollen grains and spores, is one important area of research. Through palynology we can obtain important information about past plant communities, as well as about possible plant distribution in a given geological time. At archaeological sites, pollen grains can be found inside the sediments; in the funeral urns, on the surface of objects manipulated by humans, or even on the surface and inside fossilized feces – coprolites. Pollen is very durable as its wall is made of sporopollenin (Reinhard & Bryant 1992).

Objectives

The main goals of the present study are:

1- To provide a great biological interest about history of tombs flora
2- To clarify the ancient Egyptian Thoughts about herbal medicine hereafter
3- To understand agricultural activities and food regime in the old time
Mendes, the Greek name of the Ancient Egyptian city of Djedet, also known in Ancient Egypt as Per-Banebdjedet ("The Domain of the Ram Lord of Djedet") and Anpet, is known today as Tell El-Roba. The city is located in the eastern Nile delta (30°57′30″N 31°30′57″E 30.95833°N 31.51583°E) and was the capital of the 16th Lower Egyptian Kha, until it was replaced by Thmuis in Greco-Roman Egypt. The two cities are just several hundred meters apart. During the 29th dynasty, Mendes was also the capital of Ancient Egypt Hayes (1964) which lies on the Mendesian branch of the Nile (now silted up), about 35 km east of al-Mansurah. Civilization in the area goes back to the Old Kingdom as the most ancient discovered tombs there, are mastabas referred to the first and second dynasties but scholars proved their use during pre dynasties and archaic periods Redford (2004).

Fig.1 Map of Ancient Egypt showing the study site
Material and Methods

Six soil samples from pottery jar remains or content found in two ancient tombs were taken for pollen analysis (10 each). The samples were collected in April 2003 and taken to Environmental Studies and Research Institute (ESRI) at University of Menofia Egypt for. Three grams subsamples from extracted for their pollen content using monofilament sieving according to the method of Faegri and Iversen (1989), Moore, Webb and Clark (1977). Three g (sub-sample) were placed in thermoplastic tubes, mixed with 10 ml KOH (10%), placed in boiling water bath for 15 minutes according to Faegri and Iversen (1989). The samples were sieved through a 100 um mesh. The pollen grains were settled in monofilament sieve (7um), and then washed with distilled water. The washings were made up with distilled water and centrifuged at 3000 r.p.m for 3 minutes. The liquid was decanted and 10 ml of Hydrofluoric HF (40%) were added, than put in boiling water bath overnight, centrifuged and decanted. The pellet or precipitate was re suspended in 10% HCL to dissolve residual silicoflorides, centrifuged and decanted. The pellet re-suspended in Glacial Acetic Acid to dehydrate prior to acetolysis and then acetolysed according to Moore et al (1991). The purified samples were mounted on glass slides and up to 300 pollen grains counted. Pollen identification routinely used x400 magnification with x1000 magnification for small and difficult types with reference standard keys Andrew (1984), and reference herbarium collection specimens of Environmental Studies and Research Institute (ESRI) Sadat City, Minufiya University while, pollen and spores nomenclature follows Bennet et al. (1994). Light microscope photographs of fossil pollen were taken.

RESULTS

The analysis of samples yielded a variety of pollen types (Fig. 2 and 3, plate 1); it shows the different pollen grain types extracted from tomb remains and their relative abundances. Hordeum pollen type 45% is the dominant in sample extracted from goat's tomb at Tell El Roba (Mendes) with relative abundance 8, 45, 22 and 25% for Avena, Hordeum, Triticum and Vicia faba pollen types respectively and the lowest Avena 8%. Data obtained from sample for a young girl's tomb Old Kingdom about (3100-2780 BC). (Mendes) revealed that, also Cereals (Triticum 25%) was the dominant type followed by Vicia faba 22%, while the lowest representation for both Ambrosia and Thymus 2.5%, the relative abundances of pollen types were recorded in this sample, e.g. Cyperus papyrus, Avena, Hordeum, Triticum, Achillea, Ambrosia, Acacia, Vicia faba, Ammi, Anethum, Coriandrum and Thymus pollen types respectively with values 5, 10, 18, 25, 5, 2.5, 8, 22, 7, 5, 10 and 2.5%, (Fig.3 plate 1).
Photograph 1: Pottery Jar of tomb (Old Kingdom ca. 2780-2400 BC) at Tell El Roba (Mendes)

Photograph 3: Goat's tomb show some pottery jars (Old Kingdom ca. 2780-2400 BC) at Tell El Roba (Mendes)
Table 1 Relative abundance of fossil pollen extracted from archeological samples from goat's tomb dating Old Kingdom ca. 2780-2400 BC. (Mendes)

<table>
<thead>
<tr>
<th>Pollen type</th>
<th>Relative abundance %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avena</td>
<td>8%</td>
</tr>
<tr>
<td>Hordeum</td>
<td>45%</td>
</tr>
<tr>
<td>Triticum</td>
<td>22%</td>
</tr>
<tr>
<td>Vicia faba</td>
<td>25%</td>
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</tbody>
</table>

Table 2 Relative abundance of fossil pollen extracted from archeological samples of the tomb for a young girl Predynastic period, ca. 3100-2780 BC. (Mendes)

<table>
<thead>
<tr>
<th>Pollen type</th>
<th>Relative abundance %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyperus papyrus</td>
<td>5%</td>
</tr>
<tr>
<td>Avena</td>
<td>10%</td>
</tr>
<tr>
<td>Triticum</td>
<td>22%</td>
</tr>
<tr>
<td>Vicia faba</td>
<td>25%</td>
</tr>
<tr>
<td>Hordeum</td>
<td>18%</td>
</tr>
<tr>
<td>Triticum</td>
<td>25%</td>
</tr>
<tr>
<td>Achillea</td>
<td>5%</td>
</tr>
<tr>
<td>Ambrosia</td>
<td>2.5%</td>
</tr>
<tr>
<td>Acacia</td>
<td>8%</td>
</tr>
<tr>
<td>Vicia faba</td>
<td>22%</td>
</tr>
<tr>
<td>Ammi</td>
<td>7%</td>
</tr>
<tr>
<td>Anethum</td>
<td>5%</td>
</tr>
<tr>
<td>Coriandrum</td>
<td>10%</td>
</tr>
<tr>
<td>Thymus</td>
<td>2.5%</td>
</tr>
</tbody>
</table>
**Fig. 2** Relative abundance of fossil pollen types from archeological samples extracted from goat's tomb. Old Kingdom, ca. 2780-2400 BC (Mendes)

**Fig. 3** Relative abundance of fossil pollen types from archeological samples from the tomb for a young girl Predynastic period, ca. 3100-2780 BC. (Mendes)
Discussion

In the present study pollen record of Cereals and Legumes (Hordeum 45% + Triticum 25% and Vicia faba 25%), and medicinal plants (please add!) were found. Figs 2 and 3 and plate.1 showed that Cereals pollen type Hordeum 45% is the dominant in sample collected from domestic goats' tomb (Predynastic ca. 3100-2780 BC). Presence of high amount of pollen types of Hordeum and Triticum may indicates that Cereals were important for feeding animals or that may have been presented as a gift for domestic goats. In this connection Redford (2004) stated that the chief deities of Mendes were the ram deity Banebdjedet (lit. Ba of the Lod of Djedet), who was the Ba of Osiris. Avena pollen type recorded 8% this low representation may be due to the weed nature in cultivated land; in this connection Koff (1995) stated that Triticum, Avena and Hordeum types altogether indicate the presence of cultivated land. On the other hand, samples extracted from the tomb of a young girl (Predynastic period, ca. 3100-2780 BC. Mendes) revealed that Cyperus papyrus pollen type recorded 5%; this low representation may be due to the fact that C. papyrus is growing along Nile canals in this connection, Ayyad, (1988) stated that Cyperaceae species were growing in wet or dry places, comprehending species of both salty and un-salty habitats. Achillea pollen type recorded 5% abundance in a?? Sample extracted from jar of kitchen remains dating back to New Kingdom Ayyad, (1995); this may indicate the use of Achillea as a medicinal herb during this period. This herb is being used in recent medicine to cure intestine and liver Ayyad (1995). The Ambrosia type recorded 5%, in this connection Patrick et.al (2009) in their study on "Ancient Egyptian herbal wines" stated that, there are two herbs of Egyptian origin should also be noted: Ambrosia maritima contains camphor and carvone and Conyza dioscorides has camphor and linalool. Acacia 8.8%, these plants were classified mesophytic, which indicating mesophytic habitats at Late Roman Period, El Hadidi (1985). The presence of Vicia faba (broad bean) with relative abundance 22% may support the use of ancient Egyptians to this crop as a human food, this explanation agree with Ayyad, (1995) and Ayyad and Krzywinski (1995); they stated that Vicia faba pollen type was found in the Old Kingdom with relatively high frequencies and the Broad bean (Vicia faba) introduce into agriculture in ancient Egypt during the New Kingdom, but they found fossil pollen of this crop with high concentration from Mendes archaeological site. The relative abundance of fossil pollen extracted from archaeological samples of young girl's tomb (Predynastic period, about 3100-2780 BC). (Mendes), Apiaceae, Ammi, Anethum and Coriandrum types recorded with 7-5 and 10% respectively, this may indicate that Apiaceae plants had been widely cultivated during this period (Plate1, d-e and g). The addition of Fabaceae chopped straw to Cereals as a temper was happened; in this connection Ayyad (1995) found similar results at tombs of Saqqara. Herbs played a major part in Egyptian medicine for instance include opium, myrrh, frankincense, fennel, cassia, senna, thyme, henna, juniper, aloe, linseed and castor oil (Patrick
et.al 2009). -It was interesting to find Acacia pollen type in high abundance in the kitchen remains, this may indicate that Acacia trees were abundant at the study area (Mendes, Nile Delta, throughout the 2nd Millennium B.C.) and being used as a fire wood source in ancient Mendes and Avaris (Thanheser, 1992). Plants of Apiaceae e.g. Apium graveolens L Anethum graveolens, Carum carvi, Coriandrum sativum, Foeniculum vulgare Cuminum cyminum), Pimpinella anisum L, Ammi visnaga and A.majus were used as spices, hot drinks, food additives and medical remedies (Grivetti, 2001). Thyme recorded the lowest representation 2.5%, Manniche (1989) stated that Thymus, a well-known temple fumigant and beverage additive, is to be translated as “mint” according to inscriptions in the late first millennium BC temples at Edfu.
Legends to plate 1:

Pollen grains of: (a) *Acacia* (84um), (b) *Achillea* (33um), (c) *Ambrosia* (31um), (d) *Amm* (27um), (e) *Anethum* (29um), (f) *Avena* (28um), (g) *Coriandrum* (35um), (h) *Cyperus papyrus* (32um), (i) *Hordeum* (72um), (j) *Thymus* (43um), (k) *Triticum* (75um), (l) *Vicia faba* (47um)

Magnification (x=1000)
References


Hayes, W. (1964) 'Most Ancient Egypt', p. 87, JNES, 23, 73-114


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