

OILS AND EMBALMING BALMS FROM THE TOMBS TT14 AND M.I.D.A.N.05  
AT DRA ABU EL-NAGA (LUXOR-EGYPT)

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## Introduction

Oils, resins, and ointments had very wide use in ancient Egypt, especially in funerary contexts. The use of these substances is both attested by textual sources, visual arts and archaeological evidence in mummification, as votive offerings or poured on the grave goods, and in pre-and post-burial rituals such as the Opening of the Mouth or the Osirian rites.

Two papyri give information about their use in mummification, one in the Louvre (Pap. Louvre 5.158), another one found by Mariette in Thebes (P. Boulaq III), both dating to the Roman Period but concerning previous embalming rituals.<sup>1</sup> The corpse, after washing it, removing organs and drying it with natron, was sprinkled with oils, scents and resins. All parts of the body were scented separately by lots of different oils and resins. Until Middle Kingdom (first part of the 2<sup>nd</sup> millennium B.C.) mummification balms were spread on the face, eyes included, while, for the remaining parts, only bandages were soaked. Since the 18<sup>th</sup> dynasty (about 1500 B.C.), resins started to be used inside the body, in particular inside cranium and in subcutaneous areas.

Priests, while anointing the body with resins, recite magic and ritual spells. Both incantations and resins are in fact necessary for the rebirth of the dead. Each oil and essence has a specific function, such as the ointment *nekenem* which beautifies the body, the *ladanum* which stimulates the heart and encourages it in its journey to the afterlife or the essence of pine *ach* which protects it from its enemies. The head is the first part to be perfumed with oil of *frankincense*, to give it the scent of the god. Then the process requires ten further anointments performed on other parts of the body, using the ointments of the ceremony of the Opening of the Mouth. The head is anointed again with a consolidating substance having myrrh powder and liquid juniper resin as a base in order to “rattacher la tête et (...) rattacher le visage”.<sup>2</sup> The 7 sacred oils, whose original composition we do not know, except for some information on their

1 Goyon, J.-C. 1972. *Rituels funéraires de l'ancienne égypte*. Paris, 21-22

2 Goyon, J.-C. 1972. *Rituels funéraires de l'ancienne égypte*. Paris, 54

manufacture, are among the oils used in this ceremony. The main source of information are here again later texts, those of the so-called Laboratory of the temple of Edfu, dating to the Ptolemaic period. We know that they were not used undiluted, but mixed with other substances, and their preparation was known only to a few Maitres-Parfumeurs. These oils, whose number will increase in time up to 10, as already said were also used during the ceremony of the Opening of the Mouth in order to restore life to the seven orifices of the head. From the New Kingdom the Opening of the Mouth ritual begins to be accomplished in the grave, initially only on the statues, and later on the mummies.

This ritual was not the only one involving oils and resins: Julia Budka assumes that the beakers and cups containing residues of resins and incense, dating back to the first millennium BC and found in Theban tombs, were used during rituals for the worship of Osiris.<sup>3</sup> What seems to suggest a cultic function is their discovery in open courts or underground rooms related to cultic libation, as well as their association in some case with libation vessels. In some cases they were also found near the body of the deceased, supporting an offering function. Julia Budka recognises the same vessels in Umm el Gaab in relation to the worship of Osiris.<sup>4</sup> This cult grew in importance in Thebes, in the first millennium BC, and this appears to be, in the scholar's opinion, the very reason for a change in burial customs which affects not only the architecture of the tomb but also its grave goods and funerary rituals: the tomb becomes a temple for the deceased who enters the world of Osiris. The transformation could therefore also explain the use of moving the so-called embalming *caches* outside the tomb, starting from the Third Intermediate Period. The embalming *caches* are deposits of mummification waste products, placed in coffins of little value (Type A) or in clay pots (Type B).<sup>5</sup> As precious substances, they were buried, but out of the tomb,<sup>6</sup> and therefore far from the dead, because they were impure.<sup>7</sup>

### TT 14 e M.I.D.A.N.05

The archaeological mission of the University of Pisa directed by Marilina Betrò started, in 2003, the excavation of Theban Tomb 14 (TT 14), located on the East side of the main hill of Dra Abu el-Naga, in the necropolis of ancient Thebes ( Luxor- Egypt ) (fig.1).<sup>8</sup>

- 3 Budka, J. 2010. The use of pottery in funerary contexts during the Libyan and Late Period. In Bareš, L., Coppens, F., Smoláriková, K. (eds.), *Egypt in Transition. Social and Religious Development of Egypt in the First Millenium BCE, Proceedings of an International Conference, Prague, September 1-4, 2009*. Prague, 44
- 4 Budka, J. 2010. The use of pottery in funerary contexts during the Libyan and Late Period. In Bareš, L., Coppens, F., Smoláriková, K. (eds.), *Egypt in Transition. Social and Religious Development of Egypt in the First Millenium BCE, Proceedings of an International Conference, Prague, September 1-4, 2009*. Prague, 44
- 5 Aston, D. 2011. *t3 p hrt wty* The Saqqara embalmers caches reconsidered; typology and chronology. In Aston, D, Bader, B., Gallorini, C., Nicholson, P., Buckingham, S. (eds.), *Under the potter's tree. Studies on Ancient Egypt presented to Janine Bourriau on the Occasion of her 70<sup>th</sup> Birthday*. Leuven-Paris-Walpole, 49
- 6 Aston, D. 2003. The Theban West Bank from the Twenty-fifth Dynasty to the Ptolemaic Period. In Strudwick, N., Taylor, J. H. (eds.), *The Theban necropolis: past, present and future*. London, 154-55; Budka, J. 2006. Deponierungen von Balsamierungsmaterial im spätzeitlichen Theben (Ägypten). Befund, Kontext und Versuch einer Deutung. In Roeder, H., Mylonopoulos, J. (eds.), *Archäologie und Ritual. Auf der Suche nach der rituellen Handlung in den antiken Kulturen Ägyptens und Griechenlands*. Vienna, 86-7
- 7 Bataille, A. 1952. *Les Memnonia*. Le Caire, 215
- 8 Betrò, M. 2004. Excavation of Theban Tomb 14 (Huy) at Dra Abu el-Naga (Gurna - Luxor). Preliminary Report (season 2003). *Egitto e Vicino Oriente* 27, 45-60; Betrò, M. 2007. MIDAN. Missione Archeologica Italiana a Dra Abu el-Naga (Gurna - Luxor). VI Campagna, (Novembre 2006). *RISE* 3, 55-60; Betrò, M. 2010. Rapporto preliminare sulla X campagna di scavo dell'Università di Pisa nella necropoli tebana (Dra Abu el-Naga). Campagna novembre-dicembre 2010. *RISE* 5, 33-41, tav. I-II; Betrò, M., Del Vesco, P. 2006. Dra Abu el-Naga (Gurna, Luxor - Egitto) Campagne III-IV (2004-2005). *Egitto e Vicino Oriente* 29, 5-64; Betrò, M., Del Vesco, P., Miniaci, G. 2009. Seven seasons at Dra Abu el-Naga. *The tomb of Huy (TT 14): preliminary results*, Pisa; Betrò, M., Del Vesco, P., Miniaci, G. 2009. Egitto, la necropoli di Tebe. *Athenet* 28, 12-15; Betrò M. in <http://sta.humnet.unipi.it/index.php?id=43>



Figure 1. View of the area. On the left TT 14, on the right M.I.D.A.N.05 and a part of the courtyard (Photo of the Missione Italiana a Dra Abu el-Naga (reproduced with permission of prof. Marilina Betrò).

The archaeological investigation of the tomb, still in progress, led, in 2004, to the discovery of another small tomb dating to the Third Intermediate- Saitic Period (tomb E), and a third grave, labelled “M.I.D.A.N.05” by the acronym of the mission (Missione Italiana a Dra abu el-Naga) (fig.2). The three tombs had been completely sealed in the past by alluvial deposit, with the exception of a room of TT 14, already cleared in the early twentieth century: the rare but violent storms affecting sometimes the desert in the Theban region, channeled by *wadi*, in fact flood the necropolis with alluvial deposit, accumulated in layers in the graves. The flash floods not only damaged much of the existing organic matter, but also ruined part of the paintings decorating the walls, adding their devastating action to that of time and looters, both ancient and modern (19<sup>th</sup> century and beginning of 20<sup>th</sup>). When archaeological investigations in Pisa concession started, only the paintings in the chapel of TT 14 and a small part of those in the hall of MIDAN.05 were intact. This combination of factors prevents so far to know the name of the first owner of MIDAN.05, but both some elements in its plan<sup>9</sup> and the

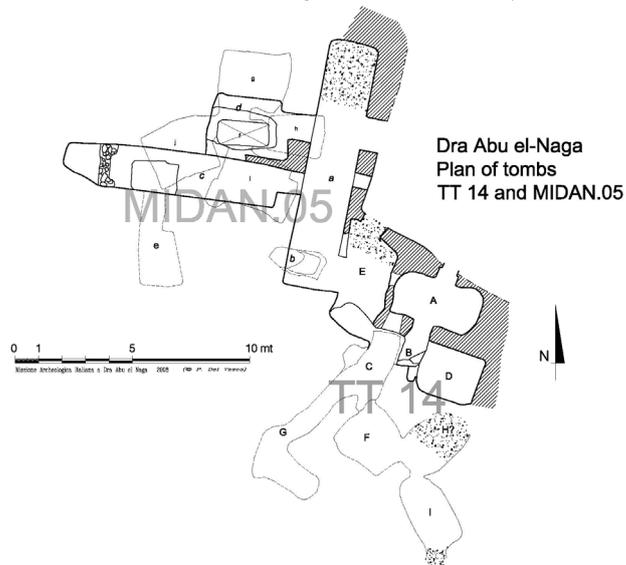


Figure 2. Plan of tombs TT 14 and M.I.D.A.N.05 (Photo of the Missione Italiana a Dra Abu el-Naga (reproduced with permission of prof. Marilina Betrò).

9 Betrò, M., Del Vesco, P. 2006. Dra Abu el-Naga (Gurna, Luxor - Egitto) Campagne III-IV (2004-2005). Egitto e Vicino Oriente 29, 25

discovery of fragmented *rishi* coffins<sup>10</sup> allow to date the construction of the tomb within the end of the 17<sup>th</sup> and the beginning of 18<sup>th</sup> dynasty (second half of the 16<sup>th</sup> century BC). The tomb has been used for many centuries, until the Roman period.

As for TT 14, which is slightly more recent, the inscriptions, still preserved, allow us to know the name of its owner, Huy, a priest assigned to the cult of the deified king Amenhotep I, who lived in the Ramesside period (13<sup>th</sup>/11<sup>th</sup> century BC). The tomb of Huy, also, was used - or reused - for some centuries. The latest occupation, though, does not go beyond the Late Period (7<sup>th</sup> - 4<sup>th</sup> century BC).

Nowadays, MIDAN.05 has been completely investigated, except for a part of its courtyard and for a funerary shaft located there, in front of the southern part of the façade, found in 2011. Digs in TT14 are still in progress and, moreover, at least two further tombs, whose entrance was found in 2010, are yet to be explored.



Figure 3. Federica Facchetti during the samples of organic residues from pottery (Photo of the Missione Italiana a Dra Abu el-Naga (reproduced with permission of prof. Marilina Betrò).

### Chemical investigations on organic residues from the two tombs. The archaeological samples

Chemical investigation has been carried out on samples of organic residues found in pots (fig.3) or mummies retrieved in the tombs MIDAN.05 and TT14, and belonging to different periods: from the Third Intermediate Period to the Roman era (11<sup>th</sup>/ century BC -2<sup>nd</sup>/3<sup>rd</sup> century AD).<sup>11</sup>

In particular, two samples were taken from a mummy, one from the thorax and one from the abdomen, while the samples of organic compounds contained in vessels come from a Phoenician

10 Betrò, M., Del Vesco, P., Miniaci, G. 2009. Egitto, la necropoli di Tebe. *Athenet* 28,13; Miniaci, G. 2011. *Rishi Coffins and the funerary culture of Second Intermediate Period Egypt*, London, 75-76, 311-12.

11 Facchetti, F., 2007. Caratterizzazione tramite GC-MS di residui organici rinvenuti nelle tombe TT14 e MIDAN.05. In Betrò, M., Del Vesco, P., Ghiroldi, A., Preliminary report on the University of Pisa 2007 season in TT14 and M.I.D.A.N.05. *Egitto e Vicino Oriente* XXX, 36-38

*amphora*, two *amphorae* with waste products of the embalming process, a *balsamarium* and a beaker. The GC-MS analyses were carried out in collaboration with Erika Ribechini at the Laboratory of Organic Chemistry of the Department of Chemistry and Industrial Chemistry of University of Pisa, directed by Maria Perla Colombini.

The original context and disposition of pots and mummified bodies found during the excavation is not always easy to reconstruct because of the alternating events through the history of the tomb: first, its constant reuse, often resulting in a shift of the grave goods, then -and more impacting- the devastation caused by floods and looters. The mud and debris flow in some cases invaded the two tombs with such a violence to destroy everything on its path, in particular vessels, whose fragments were scattered throughout the floor. Looters entered the tombs both in ancient and in recent times,



Figure 4. The amphora with embalming material found in MIDAN.05 (Photo of the Missione Italiana a Dra Abu el-Naga (reproduced with permission of prof. Marilina Betrò).

but especially the latter disturbed the original contexts. Modern thieves in fact had to dig their way through the thick compact layers of mud and limestone flakes carried into the tombs by the floods, upsetting part of the original stratigraphy and context. What remains of them and the distribution of the vessels fragments, however, allow to argue in many cases their original place.

The mummified body had been found in the transversal hall of MIDAN.05, a location which is not surprising, belonging to one of its reuse phases. The context of its retrieval - alluvial deposits - and the location, almost on the axis of the main door of the tomb, could also suggest that it had come, with parts of his coffin, from the outside, transported by the mud floods. The anthropological examination showed that the mummified individual was a male with an estimated mature adult age (35-50 years). Over his left femur the remains of a child aged 8 months - 1 year were found, wrapped in bandages.<sup>12</sup>

Several fragments of a painted coffin were found along with the body, belonging to a type dating back to the final part of the 21<sup>st</sup> dynasty (beginning of the first millennium BC). In the same transversal hall of MIDAN.05 was also found the Phoenician amphora, dating back to a period between the 6<sup>th</sup> and 5<sup>th</sup> centuries BC.<sup>13</sup> One of the two amphorae (fig.4) containing the waste

- 12 Lippi, B. 2006. The human skeletal remains: a preliminary anthropological and paleopathological investigation. In Betrò, M., Del Vesco, P., Dra Abu el-Naga (Gurna, Luxor - Egitto) Campagne III-IV (2004-2005). *Egitto e Vicino Oriente* XXIX, 47
- 13 Guidotti, M. C. 2006. Esame preliminare della ceramica proveniente da TT 14 e MIDAN.05. In Betrò, M., Del Vesco, P., Dra Abu el-Naga (Gurna, Luxor - Egitto) Campagne III-IV (2004-2005). *Egitto e Vicino Oriente* XXIX, 40 n. 15. Cfr. Hölscher, U. 1954. *The excavation of Medinet Habu V Post Ramessid remains*. Chicago, n. I tav. 47; Mysliwiec, K. 1987. *Keramik und Kleinfunde aus der Grabung im Tempel Sethos I*. in Gurna. Mainz, n. 394 p. 60; Béout, P., Gabolde, M., Grataloup, C., Jaubert, O. 1993 Fouilles dans le secteur Nord-Ouest du temple d'Amon-Re. *CahKarn IX*, n. 50 p. 199; Aston, D. 1996. *Egyptian Pottery of the Late New Kingdom and Third Intermediate Period (Twelfth- Seventh Centuries)*. Heidelberg, 242 n. 795; Aston, D. 1997. *The pottery in G. T. Martin, The tomb of Tia and Tia. A royal monument of the Ramesside Period in the Memphite necropolis*. London, pl. 126 n. 215a; Hamza, O. 1997. Queda. CCE V, 81 tav. X; Aston, D. 1999. *Elephantine XIX Pottery from the Late New Kingdom to the Early Ptolemaic Period*. Mainz, tav.72 nn.2044-2045; Lecuyot, G. 2007. Amphores provenant de Thèbes-Ouest de la Basse Époque à l'époque copte. CCE VIII, fig. I 1-2.

products of the embalming process, datable to the centuries between the Third Intermediate Period and the 25<sup>th</sup> dynasty (9<sup>th</sup> - 7<sup>th</sup> century BC.),<sup>14</sup> was found in the long corridor perpendicular to the transversal hall, and precisely behind a plastered stone wall, probably built to give a more regular rectangular shape to the bottom of the room, which had not been possible to obtain by cutting the rock. The absence of additional grave goods and the small size of the space make unlikely to assume that it had been used as a burial place.

As for the balsamarium (fig.5) and the beaker (fig.6), they were found in one of the burial



Figure 5. The balsamarium (Photo of the Missione Italiana a Dra Abu el-Naga (reproduced with permission of prof. Marilina Betrò).



Figure 6. The beaker (Photo of the Missione Italiana a Dra Abu el-Naga (reproduced with permission of prof. Marilina Betrò).

chambers dug out at the bottom of the funerary shaft.<sup>15</sup> Both date to the Roman period<sup>16</sup> and were found along with others in the same room. Other beakers still contained some organic residues, and some of them bore inscriptions on their sides which allow to attribute them the function of plant/officinal herbs containers.<sup>17</sup> In particular, one beaker had a demotic inscription: *ꜥsr (?) r irp* (“Tamarisk (?) added to wine”), another one a hieratic one: *isw š3* (“swamp reed”). They are officinal plants, the first of which was added to wine. In this regard it is possible to argue a connection with the fragment of a third beaker with a demotic inscription: *hn 1/6*, that indicates therefore a measure of capacity for liquids.

The four burial chambers retain traces of both the most ancient and the most recent use of

- 14 Facchetti, F., 2007. Caratterizzazione tramite GC-MS di residui organici rinvenuti nelle tombe TT14 e MIDAN.05. In Betrò, M., Del Vesco, P., Ghiroldi, A., Preliminary report on the University of Pisa 2007 season in TT14 and M.I.D.A.N.05. *Egitto e Vicino Oriente XXX*, 36-38. Cfr. French, P. 1987. *Late dynastic pottery from the vicinity of the south tombs in B. Kemp, Amarna Reports III, Occasional publications 4*. London, fig. 9.21.4; Redford, D. 1994. *The Akhenaten temple project. The excavation of Kom el-Ahmar and environs vol. III, Aegypti texta propositaque 2*. University of Pennsylvania, Pl. LXVI n. 4
- 15 Facchetti, F., 2007. Caratterizzazione tramite GC-MS di residui organici rinvenuti nelle tombe TT14 e MIDAN.05. In Betrò, M., Del Vesco, P., Ghiroldi, A., Preliminary report on the University of Pisa 2007 season in TT14 and M.I.D.A.N.05. *Egitto e Vicino Oriente XXX*, 36-38. Cfr. Myers, O. H., Fairman, H. W. 1931. Excavations at Armant, 1929-31. *JEA 17*, Pl. XLVI n. 405
- 16 Facchetti F., Ribechini E., Betrò M., Colombini M. P. 2012. Organic residues analysis: the case of beaker found in Theban Necropolis (Egypt). *International Journal of Conservation Science*, vol. 3, Issue, 259-264. Cfr. Mostafa, M. F. 1985. Erster Vorbericht über die Arbeiten im Grabe des Mahu (Theben No. 257). *ASAE 70*, Taf. II n. a
- 17 Betrò M. C., Facchetti F., Guidotti M. C., Menchetti A. 2008. Vasi con iscrizioni demotiche e ieratiche dalla tomba M.I.D.A.N.05. *Egitto e Vicino Oriente XXXI*, 97.

the tomb. In one of these chambers, in fact, fragments of sarcophagi rishi (16<sup>th</sup> century BC. approximately) and vessels from the Roman period (2<sup>nd</sup>/ -3<sup>rd</sup> century AD) have been found. In particular, the beaker and the *unguentarium* were found in a recess around 80 cm wide, 25 cm



Figure 7. The amphora with embalming material found in TT 14 (Photo of the Missione Italiana a Dra Abu el-Naga (reproduced with permission of prof. Marilina Betrò).

deep and 55 cm high, whose base is about 35 cm higher than the room floor, not far from the entrance. The context of finding seems to be the original one, despite the looters disturbing action. Finally, the second amphora (fig.7), dating from the Saite period (7<sup>th</sup>/ -6<sup>th</sup> century BC)<sup>18</sup> and containing the waste products of the embalming process, was found in TT14, in a very low room or loculus cut into the rock during a later enlargement of the tomb, probably at the same time as the amphora (7<sup>th</sup>/ -6<sup>th</sup> century BC).

### Methods and instrumentation

The GC/MS analytical procedure<sup>19</sup> can be summarised as follows: a sub-sample (1-3 mg) of the vessel contents was subjected to alkaline hydrolysis by adding 1 ml of methanolic KOH [KOH CH<sub>3</sub>OH (10% weight)/ KOH H<sub>2</sub>O (10% weight), 2:3], and heating at 60°C for 3 h. After hydrolysis,

neutral organic components were extracted with n-hexane (3 x 500 µl) and, after acidification with hydrochloric acid (10 M; to pH 2), the acidic organic components were extracted from the hydrolysate with diethyl ether (3 x 500 µl). Aliquots of both fractions were evaporated to dryness under a gentle stream of nitrogen and subjected to trimethylsilylation. This was achieved by mixing the dried aliquots with an internal standard solution (5 µl of n-tridecanoic acid solution, 140 mg g<sup>-1</sup>) and derivatising with 20 µl of BSTFA (at 60°C, 30 min), using 150 µl iso-octane as the solvent. After adding 10 µl of n-hexadecane solution (80 mg g<sup>-1</sup>) as an internal standard for the injection, 2 µl of the solution were analysed by GC/MS.

The GC/MS was a Trace GC (ThermoElectron Corporation) equipped with a PTV injection port, linked to a Polaris Q (ThermoElectron Corporation) ion trap-MS detector (EI 70eV, ion source temperature 230°C, scanning m/z 50-650, interface temperature 280°C). The PTV injector was operated in the “constant temperature splitless with purge” mode at 280°C with a purge pressure of 100 kPa. GC separation was performed on an HP-5MS chemically bonded fused silica capillary column (Hewlett Packard; 5% phenyl 95% methylpolysiloxane, 30 m x 0.25 µm I.D., 0.25 µm film thickness, connected to a 2 m deactivated fused silica capillary pre-column, I.D. 0.32µm). The GC conditions were as follows: initial temperature 80°C, 2 min isothermal, 10°C min<sup>-1</sup> up to 200°C, 6°C min<sup>-1</sup> up to 280°C, 35 min isothermal. Carrier gas: He (purity 99.9995%), constant flow 1.2 ml min<sup>-1</sup>.

- 18 Guidotti, M. C. 2006. Esame preliminare della ceramica proveniente da TT 14 e MIDAN.05. In Betrò, M., Del Vesco, P., Dra Abu el-Naga (Gurna, Luxor - Egitto) Campagne III-IV (2004-2005). *Egitto e Vicino Oriente* XXIX, 40 n. 11. Cfr. Aston, D. 1996. *Egyptian Pottery of the Late New Kingdom and Third Intermediate Period (Twelfth-Seventh Centuries)*, Heidelberg, n. 777 240 n. 778 245; Anus, P., Saad, R. 1971. Habitation de prêtres dans le temple d'Amon à Karnak. *KÉMI* 21, nn. 244-61 fig.19; Béout, P., Gabolde, M., Grataloup, C., Jaubert, O. 1993. Fouilles dans le secteur Nord-Ouest du temple d'Amon-Re. *CahKarn* IX, n. 19 195
- 19 Modugno, F., Ribechini, E., Colombini M.P. 2006. Aromatic resin characterization by gas chromatography–mass spectrometry: Raw and archaeological materials. *J. Chromatogr. A* 1134, 298-304.

**Results and discussion**

SAMPLE	IDENTIFIED COMPOUNDS	MATERIAL
Mummy abdomen	saturated fatty acids: with even C10-C18, C24, C26, C30	Beeswax
	hydroxy fatty acids	Beeswax
	linear alcohols with C24-C30 carbon atoms	Beeswax
	linear alkanes with C28 and C31 carbon atoms	Beeswax
Mummy thorax	saturated fatty acids: with even C10-C18, C24, C26, C30	Beeswax
	hydroxy fatty acids	Beeswax
	linear alcohols with C24-C30 carbon atoms	Beeswax
	linear alkanes with C28 and C31 carbon atoms	Beeswax
	diterpenes: acids-dehydroabiatic, didehydroabiatic, 7-oxo-dehydroabiatic, 7-oxo-didehydroabiatic, 15-hydroxy-7-oxo-dehydroabiatic and 15-hydroxy-dehydroabiatic	Pinacea resin
Phenician amphora	saturated fatty acids: with even C10-C26	Beeswax and another lipid material
	hydroxy fatty acids- C16	Beeswax
	dicarboxylic acids: $\alpha,\omega$ -C5- $\alpha,\omega$ -C12	Lipid material
	linear alcohols with C16, C18, C24, C26 and C28 carbon atoms	Beeswax
	linear alkanes with C25 and C27 carbon atoms	Beeswax
	cholesterol	Lipid material of animal origin
Amphora with embalming material	saturated fatty acids: with even C10-C34	Beeswax and Lipid material
	unsaturated fatty acids: C18:1	Lipid material
	dicarboxylic acids: $\alpha,\omega$ -C7- $\alpha,\omega$ -C10 and $\alpha,\omega$ -C12	Lipid material
	linear alcohols with C16, C18, C24, C26 and C28 carbon atoms	Beeswax
	linear alkanes with C25 and C27 carbon atoms	Beeswax
Balsamarium	saturated fatty acids: with even C12-C18	Lipid material
	dicarboxylic acids: $\alpha,\omega$ -C7- $\alpha,\omega$ -C10 and $\alpha,\omega$ -C16	Lipid material
	phytosterols	Lipid of plant origin

Beaker	saturated fatty acids: with even C10-C18, C24, C26, C30 and odd C9, C15- C19 number of carbon atoms; branched- C15, C17	Beeswax and another lipid material
	unsaturated fatty acids: C16:1, Z-C18:1, C18:2 and hydroxy fatty acids- C16 and dihydroxy fatty acids- 9,10-dihydroxyoctadecanoic and 11,12-dihydroxyeicosanoic.	Beeswax and another lipid material
	dicarboxylic acids: $\alpha,\omega$ -C5- $\alpha,\omega$ -C13	Lipid material
	linear alcohols with C24-C30 carbon atoms	Beeswax
	linear alkanes with C28 and C31 carbon atoms	Beeswax
	diterpenes: acids-dehydroabietic, didehydroabietic, 7-oxo-dehydroabietic, 7-oxo-didehydroabietic, 15-hydroxy-7-oxo-dehydroabietic and 15-hydroxy-dehydroabietic	Pinacea resin
Amphora with embalming material	saturated fatty acids: with even C12-C34	Beeswax
	linear alcohols with C18, C22-C32 carbon atoms	Beeswax
	linear alkanes with C23, C25, C29, C30 and C31 carbon atoms	Beeswax
	diterpenes: acids-dehydroabietic, didehydroabietic, 7-oxo-dehydroabietic, 7-oxo-didehydroabietic, 15-hydroxy-7-oxo-dehydroabietic and 15-hydroxy-dehydroabietic	Pinacea resin

## Conclusions

The archaeological and chemical study carried on the above described samples confirms, on one side, recent theories about funerary practices in Thebes from Third Intermediate Period and Roman Period (1<sup>st</sup> millennium BC – 3<sup>rd</sup> century AD), at the same time casting light on new different perspectives. Very interesting is the finding *inside the tomb* of an amphora for embalming material dating to the Third Intermediate Period, which attests a different use in comparison with the more usual practice in Thebes during the first part of 1<sup>st</sup> millennium BC.<sup>20</sup> In particular its finding spot, that corresponds to embalming cache type B2 of Julia Budka's typology (groups of pots, containing used mummification materials, hair and skin remains, often in linen bags, associated with architectural remains), awards a closer attention.<sup>21</sup> The Phoenician amphora confirms instead the custom of placing foreign vases in grave goods, well attested during the first millennium BC, as status symbol of the deceased.<sup>22</sup>

The *balsamarium*, dated Roman Period, attests the will to include in the burial offering perfumed oils, clearly considered precious, as the attention to store them in very tiny containers confirms. Oils and perfumes could be offered or used during specific ceremonies as, for example, the Opening of the Mouth. These rituals were officiated inside the tomb,<sup>23</sup> what allows to understand the presence of containers with perfumed substances here. The beaker with beeswax

20 Budka, J. 2006. Deponierungen von Balsamierungsmaterial im spätzeitlichen Theben (Ägypten). Befund, Kontext und Versuch einer Deutung. In Roeder, H., Mylonopoulos, J. (eds.), *Archäologie und Ritual. Auf der Suche nach der rituellen Handlung in den antiken Kulturen Ägyptens und Griechenlands*. Vienna, 86-7

21 Aston, D. 2011. *t3 p hrt wty* The Saqqara embalmers caches reconsidered; typology and chronology. In Aston, D., Bader, B., Gallorini, C., Nicholson, P., Buckingham, S. (eds.), *Under the potter's tree. Studies on Ancient Egypt presented to Janine Bourriau on the Occasion of her 70<sup>th</sup> Birthday*. Leuven-Paris-Walpole, 49

22 Budka, J. 2010. The use of pottery in funerary contexts during the Libyan and Late Period. In Bareš, L., Coppens, F., Smoláriková, K. (eds.), *Egypt in Transition. Social and Religious Development of Egypt in the First Millenium BCE, Proceedings of an International Conference, Prague, September 1-4, 2009*. Prague, 36

23 Goyon, J.-C. 1972. *Rituels funéraires de l'ancienne égypte*. Paris, 96

and pine resin, dated too Roman period, is very interesting. These substances are ingredients of embalming balms. Therefore three hypothesis could be sustained:

- 1) The beakers were utilized for particular ceremonies in which oils and resins were necessary, such as the Opening of the Mouth.
- 2) They could be used as containers for embalming balms. In this case, it would be necessary to explain their finding inside the tomb. Salima Ikram and Aidan Dodson suppose that all material used for the mummification process was considered one-way and buried with the deceased.<sup>24</sup>
- 3) An other hypotesis could be that in Roman Period the final steps of the mummification process could take place inside the tomb, as several findings could demonstrate.<sup>25</sup> The discover of a fragment of a bronze hook, instrument used for remove the brain, in front of the entrance of a burial room near to the funerary shaft could support this hypothesis, but it seems unlikely that demanding operations, such as the removal of brain, were carried in the tomb. It is more probable that the hook was lost by embalmers.

<sup>24</sup> Ikram, S., Dodson, A. 1998. *The mummy in ancient Egypt: equipping the dead for eternity*. London, 105.

<sup>25</sup> Betrò M. in Betrò M. C., Facchetti F., Guidotti M. C., Menchetti A. 2008. Vasi con iscrizioni demotiche e ieratiche dalla tomba M.I.D.A.N.05, *Egitto e Vicino Oriente XXXI*, 93

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