



Foodstuff placement in ibis mummies and the role of viscera in embalming

Andrew D. Wade ^{a,*}, Salima Ikram ^b, Gerald Conlogue ^c, Ronald Beckett ^c, Andrew J. Nelson ^a, Roger Colten ^d, Barbara Lawson ^e, Donatella Tampieri ^f

^a Department of Anthropology, The University of Western Ontario, Social Sciences Centre, London, ON, Canada

^b Department of Sociology, Anthropology, Psychology and Egyptology, The American University in Cairo, New Cairo, 11835, Egypt

^c Bioanthropology Research Institute, Quinnipiac University, North Haven, CT 06473, USA

^d Peabody Museum of Natural History, 170 Whitney Ave, New Haven, CT 06511, USA

^e World Cultures, Redpath Museum, McGill University, Montreal, QC H3A 2K6, Canada

^f Montreal Neurological Institute and Hospital, 3801 University St, Montreal, QC H3A, 2B4, Canada

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ABSTRACT

Recent excavation of a mummified ibis, in whose bill were found numerous snails, and the 2010 radiological study of ibis mummies from Yale's Peabody Museum drew attention to the presence of bird foodstuffs intentionally placed inside mummified ibises following evisceration. The foodstuff packing in the Peabody's ibises was likely contained within the birds' own viscera. Radiographs of a hatchling ibis mummy at McGill's Redpath Museum demonstrated similar placement of foodstuffs within the eviscerated body cavity. This pattern of ibis evisceration, with the previously unreported practice of foodstuff packing, suggests the provision of an afterlife food source to the bird. These findings lend support to the idea that the viscera of ibises, and humans alike, were meant to continue their living function in the afterlife. Given that organs of digestion and respiration were specifically preserved and retained within, or in conjunction with, human mummies, the implication is that animals were also treated with similar respect and care, and the crucial role of the viscera was recognised.

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1. Introduction

The Sacred Ibis (*Threskiornis aethiopicus* – Fig. 1) is now extinct in Egypt, but was commonly mummified in ancient times for votive offerings to gain the favour of Thoth, the god of writing and wisdom (Aufderheide, 2003; Morgan and McGovern-Huffman, 2008; Nicholson, 2005). Thousands have been excavated at Abydos (Ikram, 2007; Whittemore, 1914), as many as 1.75 million birds are present at Saqqara (as estimated by Nick Fieller, information provided by a personal communication of Paul Nicholson, director of the excavations of the ibis catacombs), and more than four million were found in the catacombs of Tuna-el-Gebel (El Mahdy, 1989; Kessler and Nur el-Din, 2005).

Organ removal in the mummification process of ibises is generally considered as an uncommon practice; an early account of the unwrapping of two mummified Egyptian ibises (Pearson, 1805) supports the idea that evisceration was rarely conducted in ibis mummies. Pearson's study attributed "a soft spongy substance, lying quite loose, containing a great number of scarabaei" (1805:270) to intact viscera, and Pearson cites a similar account of reptile skin and scales in another mummified ibis (Cuvier, 1804).

However, the 2006 excavation of a Late Period mummified ibis from the Shuneh ez Zebib at Abydos (unpublished, identification by S.I.), whose bill contained numerous snails (Fig. 1); an ibis mummy at the Metropolitan Museum of Art, exhibiting a similar beak packing arrangement (in preparation, identified by S.I.); and the radiological study of ibis mummies from Yale's Peabody Museum, drew further attention to ibis evisceration and to the presence of bird foodstuffs apparently intentionally placed in mummified ibises. Subsequent radiographic examination of an ibis mummy at McGill's Redpath Museum, demonstrated a similar placement of foodstuffs in the eviscerated body cavity.

* Corresponding author. Tel.: +1 647 348 5535.

E-mail addresses: awade4@uwo.ca (A.D. Wade), salimaikram@gmail.com (S. Ikram), [G. Conlogue](mailto:Gerald.Conlogue@quinnipiac.edu), [R. Beckett](mailto:Ronald.Beckett@quinnipiac.edu), [A.J. Nelson](mailto:anelson@uwo.ca), roger.colten@yale.edu (R. Colten), [B. Lawson](mailto:barbara.lawson@mcgill.ca), [D. Tampieri](mailto:donatella.tampieri@mcgill.ca).



Fig. 1. Sketch of the Egyptian Sacred Ibis (after Cuvier, 1804:Plate LIII) and photo of the head of an ibis mummy from Abydos, showing snails packed into the beak.

The increased study of ibis and other animal mummies using state-of-the-art radiographic techniques (i.e., digital radiography, multi-detector computed tomography, etc.) has permitted researchers to examine ibis mummification more closely and without risking damage to the mummy. Three-dimensional imaging especially provides a clear view of the interior of the mummy, and is ideal for examining the contents and modifications to the body cavity. A pattern of ibis evisceration with the curious, and previously unreported, practice of foodstuff packing was revealed by our radiographic studies and suggests the provision of an afterlife food source for the bird.

2. Materials and methods

The ibises were studied using computed tomography (CT) which, because it is non-destructive, neither damages the mummy nor disturbs the anatomical relationships within the bird. Computed tomography studies of mummified remains allow for detailed three-dimensional evaluations without the difficulties of superimposition that characterise plain film radiographs. Three-dimensional visualisations, multi-planar reformatting images (MPR), maximum intensity projections (MIP), and curve-linear reconstructions have been especially valuable for



Fig. 2. Photos of the wrappings (left) and sagittally sectioned 3D reconstructions (right) of ibises (A) ANT.006924.002, (B) ANT.006924.004, and (C) RM2727.01 (RM2727.01 photo courtesy of Nicolas Morin).

close examination of human mummies, and these manipulations are no less important in the study of animal mummies.

Two ibis mummies (ANT.006924.002 & ANT.006924.004), originally from Abydos and curated at the Peabody Museum of Natural History, were scanned (0.5 mm slices, 120 kV, helical) in November 2010 using the Toshiba Aquilion 64-slice scanner at Quinnipiac University's Bioanthropology Research Institute.

Two ibis mummies (RM2727.01 & RM2727.02) from the Redpath Museum were also CT scanned (0.5 mm slices, 80 kV, helical) at the end of April 2011. One of these (RM2727.02) appears to consist only of linen wrappings, although it may contain feathers or nest grasses (Kessler and Nur el-Din, 2005), and is not discussed here. A cartonnage plaque on the surface of RM2727.01 indicates that it may originate from Saqqara or Tuna-el-Gebel, and date to the Late or Ptolemaic Period (525–30 BC), although both mummies were purchased in Thebes, a noted outlet for artifacts from diverse regions. The scans were acquired using the Toshiba Aquilion ONE 320-slice scanner at the Montreal Neurological Institute.

3. Radiographic findings

3.1. Peabody ibis ANT.006924.002 (Abydos, Roman Period, 30 BC–300 AD)

ANT.006924.002, identified as the Sacred Ibis *T. aethiopicus* (Wade, 2010), has been wrapped with its head inverted, its neck stretched ventrally along the body, and its bill running beneath the tail feathers (Fig. 2A). The wings and legs are folded close against the body. Substantial amounts of resin (or resin-like material) are apparent around the bill and legs, and the bird is wrapped in a few layers of resin-impregnated linen surrounded by further layers of plain linen.

The entire body cavity has been emptied of its organs, probably through the cloaca. A medium-density mass (likely resin) with tiny, high-density inclusions (likely natron salts or sand) is present in the lower body cavity, running to the tail base and lending support for this route's use for evisceration.

At mid-body within the body cavity there is a single packet (approximately 6 cm × 4 cm × 4 cm) filled with objects ranging from high-density, amorphous masses (rocks) to small, hollow, medium-density masses (Fig. 3A). The contents also include two or three small vertebrae (possibly from a fish – Fig. 3B) and a portion of a feather (Fig. 3C). A relatively thick, medium-density material that is probably the thick, muscled gizzard of the bird or, less likely, a resin-impregnated linen wrapping, surrounds them.

3.2. Peabody ibis ANT.006924.004 (Abydos, Roman Period, 30 BC–300 AD)

ANT.006924.004, also identified as a Sacred Ibis (Wade, 2010), has been wrapped with its head positioned atop an S-curved neck and its bill extended ventrally along the body (Fig. 2B). The wings and legs are folded close against the body. The bird is wrapped in a few layers of resin-impregnated linen surrounded by further layers of plain linen.

The entire body cavity of this bird has also been emptied of its organs through the cloaca – the skin of the remainder of the chest and abdomen is intact. A medium-density mass (resin?) with tiny, high-density inclusions (natron?) is present beneath the tail and is contiguous with two packets in the body cavity.

Within the lower body cavity there are two apparent packets; one ovoid packet (approximately 6.5 cm × 3 cm × 4 cm) filled with heterogeneous material and one long, thin, empty packet (or intestine fragment or roll of linen). In addition to eight



Fig. 3. Axial maximum intensity projections (MIP) of contents of packet in ibis 6924.2, showing (A) The hollow object (indicated), (B) The vertebrae (indicated), and (C) The feather (indicated).

snail shells (Fig. 4) identified as *Bellamya unicolor* (Wade, 2010), and a small, unidentified seed still in its hull (approximately 7.0 cm × 4.2 cm × 2.9 mm – Fig. 5), the ovoid packet contains high-density amorphous masses that might be rocks; thin, curved, high-density masses that are probably shell fragments; and numerous other small, medium-density masses. As in the case of the previous ibis, the ovoid packet likely represents the contents of the gizzard encased in the gizzard itself.

3.3. Redpath ibis RM2727.01 (Saqqara or Tuna-el-Gebel, Late/Ptolemaic Period, 664–30 BC)

RM2727.01 is a hatchling bird (7.5 cm × 2.5 cm × 2.5 cm) and is most probably an ibis (Wade et al., 2011). It has been wrapped in sufficient linen to appear an adult-sized bird mummy (27.4 cm × 10.4 cm × 6.9 cm) (Fig. 2C) and a cartonnage plaque with an ibis illustration is present on the surface of the wrappings.

This ibis has been wrapped with its head and neck curled ventrally. The head rests on the chest with the beak tucked in on the right side. The wings and legs are folded close against

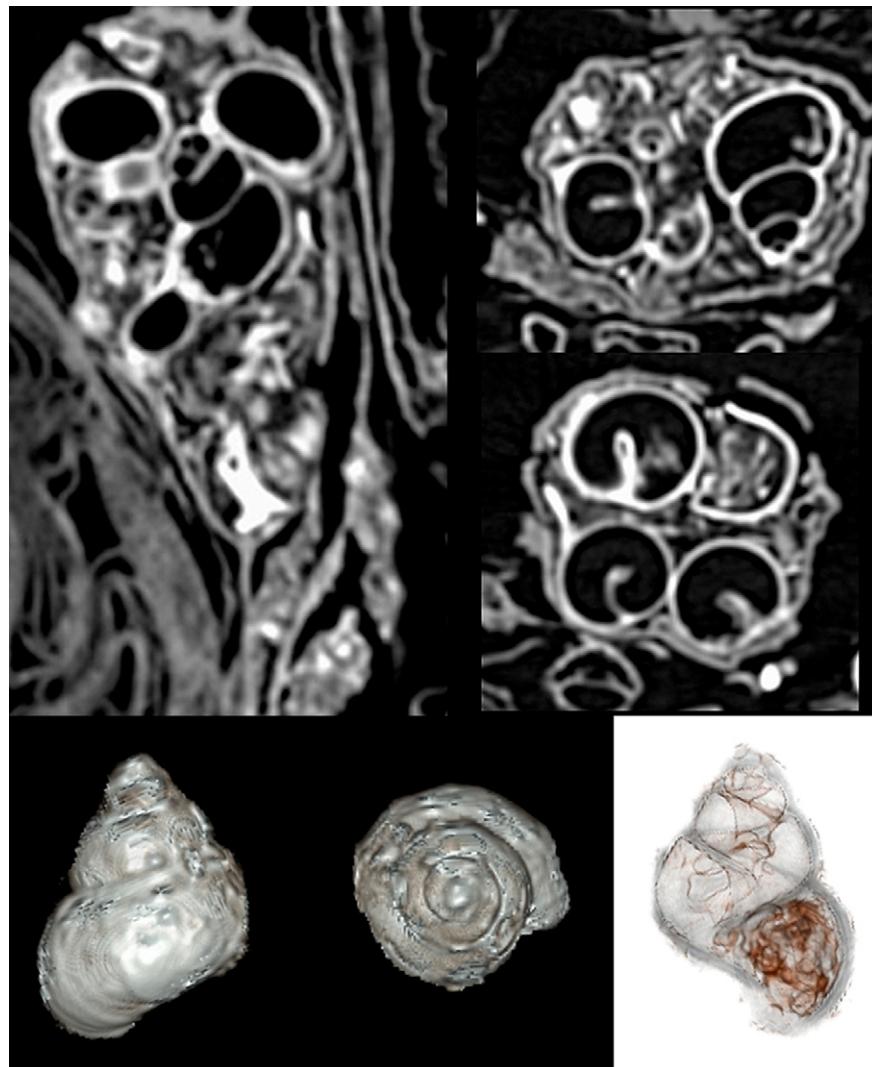


Fig. 4. Sagittal, coronal, and axial CT slices of the packet in ibis 6924.4, showing the snails, and 3D reconstruction of one of the snails.

the body. The bird is surrounded by resin, possibly from a dip in a resinous substance as part of the embalming process, and wrapped in numerous layers of plain linen, such that the whole bundle appears to contain an adult bird.

RM2727.01 has been eviscerated by way of a midline abdominal incision, and the body cavity has been partially stuffed with a medium-density heterogeneous material. The contents have the appearance of wheat grains, measuring 2 mm–3 mm

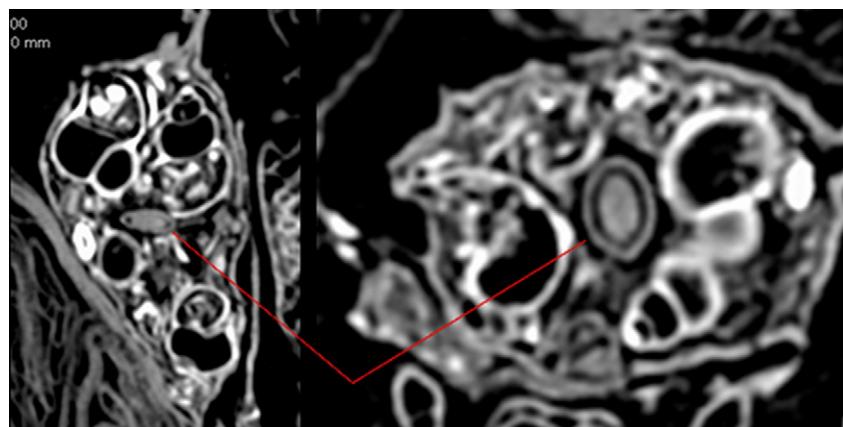


Fig. 5. Sagittal and axial CT slices of the packet in ibis 6924.4, showing the seed (indicated).

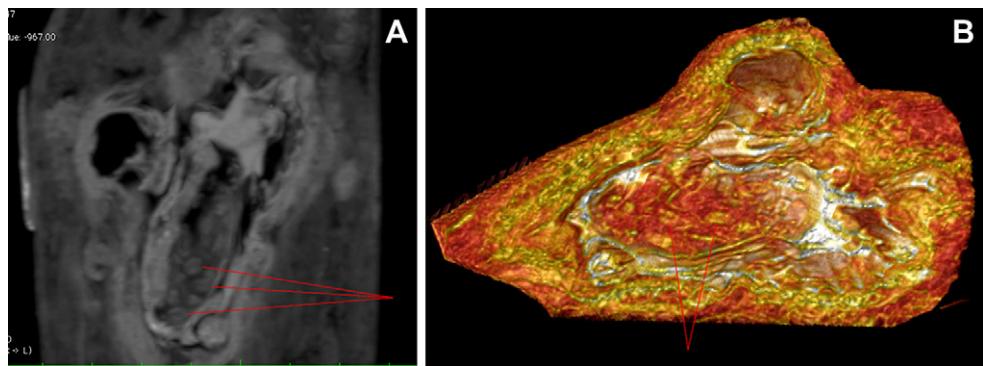


Fig. 6. Sagittal CT slice, MIP, and 3D reconstruction of the hatchling RM2727.01, showing (A) The midline abdominal incision (indicated) and (B) The grains in the abdominal cavity (indicated).

in cross-section and 5 mm–6 mm in length, and exhibiting a round, elongated shape with a longitudinal depression (Fig. 6).

4. Discussion

Although the ibises discussed here vary in age-at-death, position, resin treatment, and ornamentation, they all contain bird foodstuffs placed in the body cavity. It is very likely that, in the case of ANT.006924.002 and ANT.006924.004, that the gizzards that had been removed during evisceration were returned to the body as they were, filled with their original contents. Although the body cavity of the hatchling ibis (RM2727.01), from the Redpath collection has been filled with grain following evisceration, more like a stuffing than an indication of stomach contents, the use of grain might suggest that the ancient Egyptians intended to send this ibis to eternity with a full belly. The replacement of even one of an animal's internal organs, following evisceration, carries with it implications for the importance placed on the organs (especially of digestion) and their continued function in the afterlife.

Throughout Egyptian history the same set of organs was singled out for attention in human mummification: the lungs, liver, stomach, and intestines. While the rationale for their selection is not fully understood, it is clear that they were related to the body's vital functions: respiration and the ingestion and processing of food, the basis of the body's continued existence in the afterlife (Ikram and Dodson, 1998).

The earliest evidence for evisceration in Egyptian human mummies comes from the canopic boxes and niches for the viscera in the tombs, as in the case of Queen Hetepheres, the mother of King Khufu (Reisner, 1955). By the late 20th Dynasty, the mummification of Ramesses V initiated the practice of replacing the separately mummified organs back into the body cavity rather than placing them in separate canopic jars (Ikram and Dodson, 1998), likely to further ensure the protection of these vital organs against loss; this becomes the norm during the 21st Dynasty (1064–940 BC).

Removal of the viscera has often been thought of in terms of expediency, to remove water-filled and bacteria-laden organs for the overall preservation of the body. Embalming of the viscera separately has been thought to be initiated in order to ensure that the body remained stable, and also to provide it with access to its vital organs. The preservation of the ibis' viscera, a later and continuous phenomena through time, indicates the importance given to the practical use of the internal organs for a functional and enjoyable afterlife, the importance and significance that the Egyptians attached to the viscera and their function, protecting

them against decay, as well as the care taken in the embalming of animals.

5. Conclusions

The intentional internal placement of bird foodstuffs in votive ibis mummies following evisceration is a previously unappreciated aspect of the animal mummification tradition in ancient Egypt. The finding of foodstuffs placed in these birds, still in the bird's gizzard, lends support to the idea that the viscera of ibises and humans alike were meant to continue their living function in the afterlife. In humans, the preservation of the viscera in canopic jars, or in linen bundles returned to the body cavity beginning in the 20th Dynasty and becoming the norm in the 21st Dynasty, appears to have provided the deceased with more complete access to their vital organs, reactivated and rejuvenated through mortuary spells, and an afterlife full of the joys of the living world. This finding emphasizes the significance that the Egyptians attached to the internal organs, their understanding of their functions, and the degree to which animals were treated equally to humans in death, and perhaps also in life.

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