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## MEDIEVAL MUMMIES FROM THE PARISH TREASURY IN VODNJAN, CROATIA

**ABSTRACT:** *In this paper we have examined two medieval mummies located in the sanctuary of the parish church of St. Blaise in Vodnjan, Istria, Croatia. The analysed mummified bodies belong to Saint Giovanni Olini (1215–1300) and Saint Nicolosa Borsa (1447–1512). They were brought from Venice in 1818 by the painter, restorer and art collector Gaetano Grezler. The bodies were dressed and kept in their sarcophagi along with their equipment and holy inscriptions. The goal of this investigation was to obtain information on the physical condition of the bodies and the possible traces of human interventions that could have had an impact both on the process of mummification and on the present state of preservation. Independent chemical examinations on skin samples showed that it was coated with a mix containing olive oil and saccharide-based resin. Similarities in the appearance and composition of the skin on the two bodies indicate that the coating was applied after the bodies had entered the same collection in the first half of 19<sup>th</sup> century. It is quite probable that this intervention was done by Gaetano Grezler. Detail visual examination showed that parts of bodies relating to sexuality were missing. This could be explained as the result of a medieval post-mortem ritual or removal of these parts as relics at a later time.*

**KEY WORDS:** *Vodnjan – Medieval mummies – St. Giovanni Olini – St. Nicolosa Borsa – Anthropological analysis*

### INTRODUCTION

Mummies are deceased humans or animals whose soft tissue (skin and organs) has been preserved. Both human and animal mummies have been found all over the world, dating from different time periods (Aufderheide 2003). There are two procedures of mummification that can stop the natural processes of decay and preserve the body's integrity: natural

mummification and artificial mummification. Natural mummification occurs when the body is placed in an environment that favours its preservation, such as hot or very cold, dry climate. In the artificial mummification humans deliberately intervene by employing methods that prevent decay, such as the removal of internal organs, drying out of body cavities or application of natural or chemical substances (Lynnerup 2007). In some mummies the type of

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mummification is not always clear, given that the natural process can be enhanced by human intervention.

In medieval Europe there was a widespread belief that the bodies of Christian saints were indestructible. In the Roman Catholic tradition they were considered to be mysteriously preserved due to their holy life. Therefore appeared the phenomenon of mummified saints' bodies, also called the Holy Incorruptibles (Corpi Sancti) which have been venerated as relics up to the present day (Fornaciari, Capasso 1996).

## THE VODNJAN COLLECTION

The parish church of Saint Blaise in the small town of Vodnjan, located on the Istrian peninsula in Croatia, treasures a large collection of relics consisting of several hundred items (*Figure 1*). The collection was brought to Vodnjan from Venice in 1818 by the painter, restorer and art collector Gaetano Grezler (Verona 1765 – Venice 1839) who donated it to the town and parish of Vodnjan (Tomić 1998). The majority of objects Grezler had collected after the fall of the Serenissima in 1797 when Venetian religious

institutions were eliminated by Napoleon's edicts. The objects previously owned and cared for by churches and monasteries became easily accessible. Most of the objects in the Vodnjan collection came from the female Benedictine monastery of San Lorenzo in Venice, closed in 1806. Many of these objects actually originate from other regions of the Mediterranean and the sub-Mediterranean area, including those plundered in Constantinople after the Siege in 1204 (Munk 2006).

The most impressive part of the Vodnjan collection are four bodies of saints, that according to their accompanying inscriptions, are St. Paul of Constantinople (died c. 350), St. Leone Bembo (Venice late 12 c. – cca. 1188), St. Giovanni Olini (Venice 1215–1300) and St. Nicolosa Borsa (Kopar 1447 – Venice 1512) (Budičin 2011). They were placed in their sarcophagi along with inscriptions about their life and other objects, such as pastorals, papal stamps etc.

## RESEARCH AND CONSERVATION PROJECT

In 2009 the Croatian Conservation Institute started a project on research and conservation of the four bodies and accompanying items which were listed by the Ministry of Culture as objects of Croatian cultural heritage. The preliminary phase of the project included the examination of microclimatic conditions and a microbiological analysis. This step was particularly important because some signs of recent decay had been noticed, including traces of insect activity on wood, skin, paper and parchment, as well as the blistering of the surface of the skin of the mummies. Also, the presence of silverfish was observed. In order to better understand the causes of observed decay, further examinations were carried out in the second project phase. The microclimatic conditions were monitored throughout a year. The results were alarming due to temperature oscillation between 5°C and 27°C and the relative humidity between 40% and 90%. Following these results, the Croatian Conservation Institute proposed the disinfection of the sarcophagi along with the bodies and all equipment and the transfer of the sarcophagi into passive climate-control display cases. The disinfection was executed and the display cases were provided by the parish. The sarcophagi, the historical textile, the pastorals and the inscriptions were restored, and all the texts were copied and translated. The bodies and the textile were only surface-cleaned.

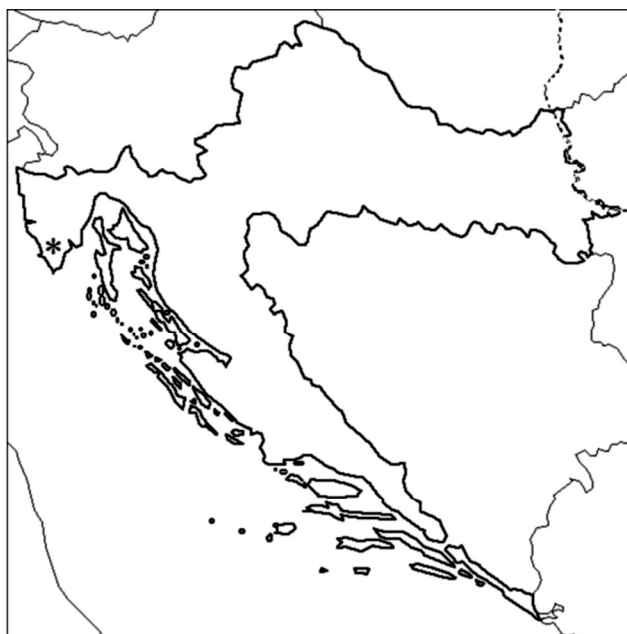


FIGURE 1. Map of Croatia with the location of Vodnjan (marked by asterisk). Croatian Conservation Institute Photo Archive.

In order to obtain more information on the preservation of the four bodies, they were examined by Dino-Lite Digital Microscope with digital camera as well as documented using multi-slice computed tomography (MSCT). For the microscopical analysis of samples, an Olympus BX 51 was used, and the photos were taken by Olympus DP 71 camera. The MSCT, executed by Frane Mihanović from the Faculty of Medicine at the University of Split, showed that two of the bodies were excellently preserved: those of St. Giovanni Olini and St. Nicolosa Borsa. Both bodies had a very well preserved skeleton as well as internal organs, muscles and tendons. On the contrary, the body of St. Leone Bembo was only partially preserved while that of St. Paul of Constantinople contained only bones.

Further detailed research was therefore focused on the bodies of Giovanni Olini and Nicolosa Borsa (*Figure 2*). Due to the delicate nature of the research subject, only non-invasive methods could be applied.

Two different types of approaches were used: anthropological analyses of the bodies and chemical analyses of various samples. The final goal was to offer, through the combined results of all analyses, some explanation of the excellent state of preservation of the saints' bodies.

## ANTHROPOLOGICAL ANALYSES

Analyses were carried out based on macroscopic and microscopic examinations together with available CT scans. Macroscopic and microscopic examinations provided basic description of the bodies that included position, state of preservation and completeness as well as body length and skin colour. CT scans were used in sex and age estimation. Sex and age were estimated based on morphological characteristics of the skull and pelvis (Buikstra, Ubelaker 1994).



FIGURE 2. Sarcophagi with the bodies of St. Nicolosa Borsa and St. Giovanni Olini before conservation. Croatian Conservation Institute Photo Archive.

### St. Giovanni Olini

The body of St. Giovanni Olini, dressed in liturgical vestments, was placed in sarcophagus. Visually the body seemed completely preserved. The body was lying on its back with the head resting on the left cheek (*Figure 3*). The left hand was laid by the body while the right one was slightly bent and placed on the body. The right leg was stretched out while the left one was slightly bent. The total body length was 173 cm. Giovanni Olini was dressed in a long cassock covering most of the body and preventing its detailed overview. The external appearance of the body is of an older adult male. An inspection of the layers of vestments on Saint Giovanni Olini suggested that it was put on his body long after death. On the face and right ear as well as on the vestment drops of bee wax were found.

All the external parts of the body were present, except several phalanges of the right foot (all the phalanges of the fourth toe and the distal phalanges of the second, third and fifth toe). Skin colour was dark brown. The head was fully preserved. Very short hair was noticed during microscopic examination. The skin was mostly preserved and was missing only on the crown and the right cheek. The nose was moulded from a hard material and fixed to the face. The orbits were empty. Teeth were present in both maxilla and

mandible. They were only partially visible due to the position of the lips. In the maxilla the first premolars and the alveolae of incisors and canines lost post-mortem were visible. In the mandible the incisors, canines and the first premolars were present. The genital organ was missing. On the knees there were numerous small perforations probably caused by parasites.

Analysis of CT scans confirmed that the body belongs to an older adult male. Sex was estimated based on morphological characteristics of the skull (prominent supraorbital ridges and mandible, large mastoid process) and pelvis (narrow pelvic girdle, absence of subpubic concavity). In addition, diameter of femoral head was 48 mm. Older age was verified by the antemortem loss of several mandibular teeth.

### St. Nicolosa Borsa

The body of St. Nicolosa Borsa, dressed in liturgical vestments, was placed in sarcophagus. Visually the body seemed completely preserved. Nicolosa Borsa was lying on her back with the head resting on the right cheek (*Figure 4*). The hands were crossed on the stomach (left over right), while the legs were stretched out. The total body length was 160 cm. She was dressed in a long dress covering most of the body and



FIGURE 3. The body of St. Giovanni Olini during conservation. Croatian Conservation Institute Photo Archive.



preventing its detailed overview. The external appearance of the body is of an older adult female. An inspection of the layers of vestments suggested that she was dressed while the body was still flexible. Veneration gifts, vanilla bean and a spirally-shaped piece of wax, were laid on her body. A wreath of silk artificial flowers was on her head.

All the external parts of the body were present, except for the left ear and several phalanges of the right foot (all distal and two middle phalanges). Skin colour was not uniform, the hands and the head being the darkest while the feet were slightly brighter. The head was fully preserved. It was covered by a veil, except the forehead and face. Very short hair was observed during microscopic examination. The breasts were lacking nipples. The skin was mostly preserved, missing only in the area around the eyes and on the nose and chin. The nose and the upper lip were moulded from a hard material and fixed to the face. The orbits were filled with an unknown substance. Teeth were present in both maxilla and mandible. They were only partially visible due to the position of the head and lips. In the maxilla all incisors and canines were visible, while in the mandible only the incisors. Some parts of both hands were completely without skin. A ring made of bee wax and brass was on the right hand. Ribs were

prominently visible on both sides of the thorax. Above the pubic bones there was a straight incision cca 10 cm in length and up to 0.5 cm in width. On the knees and lower legs there were numerous small perforations probably caused by parasites. A sweet odour, which was particularly strong immediately after opening the sarcophagus, could be sensed.

Analysis of CT scans confirmed that the body belongs to an older adult female. Sex was estimated based on morphological characteristics of the skull (small supraorbital ridges and mandible, round orbits with sharp supraorbital margins) and pelvis (wide pelvic girdle, wide subpubic angle with elongated pubic bone, triangle shaped *foramen obturatum*, broad U-shaped greater sciatic notch). Older age was verified by the antemortem loss of several mandibular teeth.

## DISCUSSION AND CONCLUSION

Investigation of mummies of saints is very important from anthropological as well as historical perspective because of their cultural and spiritual context. Numerous mummified bodies of saints date from the mediaeval period and quite often they are very well preserved. In mediaeval Europe preservation of



FIGURE 4. The body of St. Nicolosa Borsa during conservation. Croatian Conservation Institute Photo Archive.

the remains after death was considered a spiritual sign of divine recognition (Fornaciari *et al.* 2008). There are various methods of mummification that include natural and artificial processes. Many bodies of saints are result of natural mummification assisted by the use of herbs and natural products such as balsams and spices. The bodies of people considered saints were washed and treated which resulted with an effect of embalming (Fulcheri 1996). On the other hand, artificial preservation induced by complex processes is very rare (Fulcheri 1996). A large number of preserved bodies of saints are found in Italy. Out of 315 known bodies at least 25 are mummies (Fornaciari 1999).

The mummified bodies of St. Giovanni Olini and St. Nicolosa Borsa from Vodnjan, Croatia, were investigated as part of a multidisciplinary project that included anthropological and chemical analyses of bodies and investigations of accompanying objects, such as vestments, pastorals, papal stamps etc.

Anthropological analysis confirmed that both bodies were very well preserved and belonging to older individuals. At this point, we believe that preservation of both bodies is result of natural mummification assisted by use of natural substances. This is confirmed by the chemical analyses carried out on skin samples as part of the project (X-ray fluorescence spectrometry, thin layer chromatography, Fourier transformed infrared spectroscopy and gas chromatography coupled with mass spectrometry) (Rezić *et al.* 2015). They detected similarities in the composition of the coating of both bodies, specifically a mix of olive oil and saccharide-based resin. Resemblance in their preservation treatments and the fact that these individuals died in different centuries, indicate that the coating was not applied immediately after their death but much later. It is probable that this happened after the mummies had entered the Grezler collection in Venice in the first half of 19<sup>th</sup> century. The materials such as olive oil and resins are common and easily available in the Mediterranean area. In addition, the use of resinous substances was confirmed in several medieval and modern period mummies from Italy (Fornaciari, Capasso 1996). Also, resins are often used by painters, so it is probable that the treatment was performed by Gaetano Grezler, the painter who gathered the collection and restored many of its objects. Wax drops found both on the skin and the textile were probably dropped from candles and are not part of any intentional treatment.

At this moment it cannot be determined to which specific procedures the bodies were subjected to in

order to ensure their preservation. We believe that the process of mummification was facilitated by some sort of human intervention. This claim is supported by the signs of post-mortem treatment that can be seen on both bodies. These include artificially constructed nose and removed body parts relating to sexuality. The fact that St. Giovanni Olini's genital organ and St. Nicolosa Borsa's nipples are missing, could be explained as the result of the medieval post-mortal ritual to which also a cut on the St. Nicolosa pubic section and the removal of hair can be related. Moreover, another explanation can be considered as a possible cause of missing parts: since these parts were very attractive as particularly powerful relics, it is also possible that some or all of them had been taken by believers as relics (Quigley 1996).

These analyses although lacking in conclusive answers, provided some explanations of the excellent state of preservation of the saints' bodies. Nevertheless, further examination should be carried out with more sensitive and selective methods to provide more accurate facts concerning the biological features of St. Giovanni Olini and St. Nicolosa Borsa.

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