A study of the polychrome wooden statue of St John the Baptist located at Had Dingli parish church

Valentina Lupo

Introduction

This study involves a medieval wooden polychrome (the use of a variety of colours in the decoration of three dimensional objects) sculpture of St John the Baptist, presumed to have been brought to Malta in the sixteenth century by the Knights of St John.1 Mario Buhagiar was the first scholar to give this work its due importance.2 The statue is probably the only surviving example of freestanding late Gothic wooden polychrome sculpture in Malta.3 The present appearance of some works of art, including that of the present statue, is different from the time they were made, and therefore not what the artists or patrons had intended. In most cases, the aesthetic appearance of polychrome sculptures was changed at a later date, which change often happened more than once. Such renovations adapted the sculpture to the different tastes of later periods and were often carried out without any documentation.4 As a result the original polychromy of many sculptural surfaces remains unclear.5 Over the ages the statue of St John the Baptist went through a number of undocumented restoration interventions. In a main intervention the

3 Verbally communicated by Professor Mario Buhagiar on 12 March 2011. However, it is suggested that the statue of St Joseph found in the church of Santa Maria di Gesù at Rabat is possibly a medieval polychrome sculpture, judging from its features and rigid form. The statue was transformed from a possible St James into a St Joseph by layers of gesso, painting and gilding. M. Buhagiar 2009, 64-65 and M. Buhagiar and S. Fiorini, 'The True Identity of the Oldest St Joseph in Malta,' The Times of Malta 1999, June 11, 35, 37.
5 Ibid.
polychromy was covered with a dark brown coating, which transformed the statue into a monochrome sculpture. Beneath the present dark coating there are hints of polychromy on the statue, which indicate that it was gilded and painted.

1 Aims and Objectives

The decision to carry out a study of the statue of St John the Baptist was determined by the fact that hardly anything is known about its constituent materials and manufacturing technique. Furthermore, the intrinsic value of the statue has been highlighted by Buhagiar as a work of art of historical importance in Maltese cultural heritage.6 The study aimed to obtain an in-depth understanding of the statue through documentation, the monitoring of its surrounding environment and by carrying out a number of diagnostic investigations in order to:

- Understand better the structure of the statue, and its polychromy;
- Shed further light on the statue in the context of the history and techniques of the medieval period;
- Describe additions and alterations, which were a result of both natural origin and human interventions;
- Determine the statue's state of conservation.

The whole project required continuous comparison of the results obtained with significant studies in the field of conservation and art history related to polychromed wooden sculpture. Furthermore, medieval sources explaining manufacturing techniques and materials provided information on technical processes used by artists and craftsmen of the time. The identification of the constituent materials and how they were combined to construct and decorate the work of art were also required to understand the original appearance of the statue, which was very different from the one it is today.

2. The Statue of St John the Baptist: Description and Historical Background

2.1 Description and Iconography

The statue is that of a life-size robust frontally posed St John the Baptist (Fig. 1). As a whole the statue has fairly good proportions and shows a number of anatomical attributes and details that give it a certain artistic quality.

The statue is located in the sacristy of the Dingli parish church dedicated to the Assumption of the Virgin, in a recess on the south-facing wall. The figure is clad in the skin of a desert animal, probably a camel, which is worn as a tunic tied around the waist with a rope girdle.7 Folds fall in rigid pleats towards the face and claws of the desert animal.8 Their stylization gives them a sense of being a heraldic device.9 The left hand carries the Agnus Dei while the palm of the right hand is closed and most probably held a staff with a reed cross.10 The archaic and stiff appearance of the figure suggests a provincial workshop that produced cult statues.11 The statue has the idiosyncrasies of a late gothic sculpture; where it was made is unknown but is probably of Franco-Italian origin, possibly Nice, due to its presumed historical association.12

6 Verbally communicated by Professor Mario Buhagiar during the meetings related to this study.

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7 M. Buhagiar 2009, 64. John the Baptist is described in Matthew 3:4: 'And the same John had his raiment of camel's hair, and a leather girdle about his loins', C. Gibson, The Hidden Life of Renaissance Art, New York 2007, 44.
8 Buhagiar 2009, 39.
9 Buhagiar 2009, 64.
10 Buhagiar 2009, 64. St John the Baptist is most often depicted with a reed cross. The staff on the statue is probably not the original one.
11 Buhagiar 2009, 39.
12 Verbally communicated by Professor Mario Buhagiar on 2 February 2011.
2.2 History
It is thought that the wooden statue of St John the Baptist was brought to Malta by the Knights of St John in the early sixteenth century. The statue may have an association with the Gran Caracca Sant'Anna (1522-1548), possibly being one of the cult statues that adorned the ship's chapel. Since the statue is carved in the full round, the notion that it was fixed on the poop or stern of this or another ship belonging to the Order is unacceptable.

In 1684, the Prior of the conventual church Frà Pierre Vianny, donated the statue of St John the Baptist together with another carved statue of St James to the Grotto of St Paul in Rabat. A sum of 6 tari was recorded in the Grotto's accounts book; the payment was effected on 8 July 1684 to two men who transported the statues from Valletta to the Grotto in Rabat. A few years later the statues were transferred to the newly established parish church of the Assumption of the Virgin, at Dingli. The whereabouts and subsequent history of the statue of St James is unknown, as it has been missing from Dingli for some time.

Unfortunately information on the statue is very limited. In 1946 Hugh Braun reported that the statue of St John the Baptist was ‘covered with armorial graffito’. However, only one small shield is visible today which resembles the arms of Villiers de l'Isle Adam (Fig. 2), suggesting a connection with the Grand Master who brought the Knights to Malta.

Additionally, to date there has not been found any detailed description of the statue before the dark coating application, nor when the coating was applied. However it has been documented that the artist and restorer Oscar Testa (1909-1979) treated the statue against insect infestation in the 1960s. The statue was suffering severely from an insect infestation and was treated by means of an insecticide applied by a syringe.

3. Methodology
The following is an account of the scientific methodology followed to examine the constituent materials and techniques used in the wooden polychrome statue of St John the Baptist.

3.1 Non Invasive in-situ Examinations
Surface examination of the statue was carried out under normal diffuse and raking light (780-400nm). The structure of the wooden support, surface characteristics and deterioration phenomena were observed at a macroscopic level by means of both light arrangements. Close inspection using normal tungsten light was essential to view minute areas where the polychromy was not painted over. Raking light was used to reveal any surface irregularities, cracks and joints in the wooden support. The inside of the statue was examined from photos taken of the interior core by inserting a pocket camera in an upright position inside the narrow opening on the left side of the statue.

Ultra-violet (UV) light and Infra-Red (IR) Electromagnetic radiation extends beyond the visible spectrum. The use of ultraviolet light (range 400-200nm) was carried out to distinguish variations in the dark brown coating and areas where polychromy was partially visible. IR Electromagnetic radiation was carried out to have a clearer view of the graffito on the camel's forehead and to investigate if other
graffiti were present on the statue. The technique was also used to discover if any decorations were present on the tunic. X-ray Radiography was carried out to reveal the method of construction, interior armature and any past restoration repairs not visible to the naked eye.

3.2 Invasive methods of Examination through sampling
The non invasive investigations described above were useful in determining which particular areas of the statue would be chosen for representative sampling. The main areas sampled were: the tunic, right and left hand, sheep, base and pedestal. The purpose of sampling is summarised in Table 1.

<table>
<thead>
<tr>
<th>To identify original materials:</th>
<th>To identify past restoration materials:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Genus of wood</td>
<td>Genus of wood</td>
</tr>
<tr>
<td>Preparatory layers</td>
<td>Infill</td>
</tr>
<tr>
<td>Binding media</td>
<td>Overpaintings</td>
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<tr>
<td>The key set of pigments</td>
<td>Dark brown coating</td>
</tr>
<tr>
<td>Gilding technique</td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Purpose of sampling

A total of fourteen samples were collected as follows:

(i) Fragment samples
Four wood samples measuring between 3mm-4mm were taken from lacunae exposing the wooden support. The samples were analysed to identify the genus/species of wood used to construct the statue and to assess if any later interventions were present. Sampling of the wooden support was also carried out in an attempt to possibly suggest the provenance of the sculpture. The wood samples were mounted into thin sections and were viewed under an Olympus BX50 Polarized Light Microscope using transmitted light. Anatomical observations and cell characteristics for the transverse, radial and tangential sections were made. The observations were transferred to a software database to help with the identification of the genera of the wood sample.

(ii) Stratigraphic samples
Ten stratigraphic samples ranging in size between 1mm-1.5mm were taken to identify the number of polychrome layers present including restoration infills and overpainting. The analysis of the cross section samples was first carried out by observing the sample under a Binocular Microscope. The sample was then prepared into a polished cross section and the different layers were then analysed under an Olympus BX50 Polarized Light Microscope. By adopting this method, the stratigraphy and the number of layers and colours were identified. UV-fluorescence microscopy was used to identify any thin intermediate layers, such as glues and other intermediate coatings, which are not clearly shown in normal light.25

Ultimately cross-section samples were analysed in a LEO 1430 Scanning Electron Microscope (SEM) by means of a backscatter detector. Elemental analysis was then carried out at higher magnifications to identify the inorganic components in the different layers of the sample via an Oxford Link Spectrometer. Pigment particles were viewed at higher magnifications and by means of energy dispersive X-ray spectroscopy (EDX) point and area analyses. The latter was carried out to characterize the elements of different particles present, by means of computer software INCA Microanalysis Suite.

Histochemical tests were carried out directly on cross-sections to identify the nature of the organic material present in the cross-sections within the original paint layer, infills and overpaint.26 Three type of stains were used for the identification of proteins, in particular animal glue or gelatine and another stain for oils.

4. Results & Discussion

4.1 Wooden support
Close observations, including the photograph taken of the inside of the statue and X-ray Radiography, enabled a description to be made of the assembly and construction of the statue. Since only three areas were X-rayed, the exact method of construction and reinforcement of the statue as a whole cannot be fully described.

The statue is most probably composed of eight parts:
1. Main body including: right upper arm, left upper arm, camel's face, feet and base
2. Right forearm
3. Right hand
4. Back panel
5. Head, together with neck
6. Sheep together with left hand
7. Staff
8. Bas

After anatomical examination of the wood samples, four different genera of wood were identified in different parts of the statue, as illustrated in Fig. 3 and Table 2.

26 The cross-sections were polished from the carbon coating after all SEM-EDS analysis was carried out.
Fig. 3. Graphic illustration of the back and front of the statue, with colours showing different genera of wood according to the description in Table 2.

<table>
<thead>
<tr>
<th>Area</th>
<th>Genus</th>
<th>English name</th>
<th>Geographic distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proper right hand (in dark purple)</td>
<td>Pinus sp.</td>
<td>Pine</td>
<td>Europe, Mediterranean including North Africa and Middle East.</td>
</tr>
<tr>
<td>Main body (in green)</td>
<td>Juglans sp.</td>
<td>Walnut</td>
<td>Europe, excluding the Mediterranean</td>
</tr>
<tr>
<td>Pedestal (in light purple)</td>
<td>Picea sp.</td>
<td>Spruce</td>
<td>Europe, excluding the Mediterranean</td>
</tr>
<tr>
<td>Back panel (in yellow)</td>
<td>Fagus sp. or</td>
<td>Beech</td>
<td>Europe, Mediterranean including North Africa and Middle East.</td>
</tr>
<tr>
<td></td>
<td>Platanus sp. or</td>
<td>Plane</td>
<td>Europe, excluding the Mediterranean</td>
</tr>
<tr>
<td></td>
<td>Sorbus sp.</td>
<td>Service berry</td>
<td>Europe, Mediterranean including North Africa and Middle East.</td>
</tr>
</tbody>
</table>

Table 2: Different genera of wood identified on the statue

The main body of the statue was carved from the trunk of a walnut tree, which was hollowed from the back in a sort of semi-cylindrical shape cavity that started from the base of the neck (Fig. 4). During the medieval period, the subtractive method was usually employed for a sculpture. In general, a standing figure was cut from the halved section of a tree trunk. The halved trunk was clamped horizontally on an adjustable workbench that allowed the sculptor to rotate the trunk. The outline of the figure was then marked on the wooden block and the shape was roughly carved using two types of axes. The hollowing out of the interior core was a common procedure throughout Europe during the Middle Ages. This reduced the weight of the sculpture and also provided flexibility when there are changes in temperature and relative humidity. The figure was hollowed out from the back, ensuring a regular drying rate throughout the trunk. Two examples of this practice are the Volto Santo of Sansepolcro in Arezzo’s San Sepolcro Cathedral and Saint Roch found at the Metropolitan Museum of Art, New York.

Distinct tool marks are present on the walls of the cavity, which indicate that flat-cutting tools such as chisels or an adze were used. The cavity was covered with a wooden panel of a different genus inserted exactly inside the rectangular opening at the back that goes down almost the whole length of the tunic (Fig. 4 and Fig. 5).

28 Farnsworth 1997, 46.
The X-ray revealed that the head and neck region are not hollow. This ensemble was carved in the form of a bust from a separate block of wood and inserted into the top hollow part of the trunk.

The infilled hole found on the top of the head could have been made either to attach the wood block to the workbench for carving, or could also indicate where a diadem would be fixed. The left arm and right upper arm were carved from the trunk forming the main body, while the outstretched right arm was carved from a separate piece and joined to the forearm. The hands were carved separately and joined to the wrists. The hand of the outstretched arm does not appear original to the sculpture due to the different manufacturing technique. The carving of the right hand appeared to have sharp chiselling compared to the carving of the left hand; additionally the carving of the fingers of the former hand appeared sharp and unrefined (Fig. 7).

The sheep was carved together with the left hand probably from one separate block of wood, and was fixed to the central torso by means of a wooden tenon. From the X-ray pictures it appears that the camel’s face was sculpted from the same trunk forming the main body of the statue. In addition to the similarity in the medieval construction technique, there is also the carving technique. St John’s from their large, thin, round heads to their acuminate points and were driven by hammer. L. Uzielli, ‘Historical Overview of Panel-making Techniques in Central Italy’, in The Structural Conservation of Panel Paintings: Proceedings of a symposium at the J. Paul Getty Museum, April 1995, eds. Dardes K., and Rathe A., The Getty Conservation Institute, Los Angeles 1998, 122.


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hair was carved in narrow undulating furrows, which give form to the hair (Fig. 8). The latter was probably cut with narrow chisels or a v-shaped gouge. The beard and sheep's fleece were blocked out in a sequence of crossing bowed vertical strips, possibly with v-shaped and u-shaped gouges. The surface of each strip was then chiselled to form winding grooves hence creating elaborate waves. The same technique was seen on the unfinished locks of hair of Saint Ursula in Amsterdam's Rijksmuseum.

An incised hemline was visible in raking light on the tunic. IR Radiation gave no results for the presence of any form of decoration on the tunic. Also no other armorial graffiti were visible other than the one found on the central part of the camel's forehead (Fig. 2).

4.2 Preparatory layers and Polychromy
This section presents results and discussion of the investigations carried out on the cross-section samples. Results of the elemental analysis carried out on samples from various parts of the statue are illustrated in Table 3.

Table 3: Summary of results from SEM-EDX analysis
The surface of the sculpture was first treated with a layer of sizing, probably animal-skin glue, which was applied as an isolation coating to reduce the absorbent properties of the wooden support when the subsequent layers were applied. One layer of ground was later applied to cover the surface and fill the pores and other minor irregularities to provide a smooth surface. This was common practice in European medieval polychrome sculpture.

In polychrome areas, the ground was prepared by mixing lead white with low amounts of chalk (calcium carbonate) bound in an oil medium, which was applied rather thinly. These results were unexpected since in the medieval period the common practice was to apply a layer/s of chalk or gypsum bound in an aqueous medium such as animal-skin glue. The thin application of ground indicates that the wooden surface was already perfectly smooth and there was no need to define the sculptural form or even out tool marks by means of a thick ground.

The use of oil grounds concurs with original treatises on the technique written by Theophilius and Eraclius (Book III). Conversely, the lead white and chalk ground present underneath gilded areas appear to be bound in a proteinaceous medium. The application of oil ground to the painted areas and an aqueous ground to the gilded areas has been recorded in wooden polychrome sculptures in northern European countries.

4.3 Structure and Colouring Materials of the Original Polychromy

The flesh tone was modelled in a thin, pigmented layer of red ochre and red lead (minium), which provided a salmon-red colour to the flesh. Agglomerates of lead white were dispersed throughout the layer suggesting that lead white was used to tone down the bright colour of the reddish pigments.

The tunic was gilded and painted. Extensive areas were gilded and burnished both on the front and back as visual observations and analysis confirm. Gilding was applied over an orange-red clay bole bound in proteinaceous media, which indicated that the water-gilding technique was employed (Fig. 9). The thinness of the gold leaf (c.0.35μm) is proof of the delicate gilding process involved. By the end

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Fig. 9. Gilded sample STJ 007 taken from the front of the statue above the animal's ear. (i) Unmounted sample red arrow indicating unburnished layer of gold leaf; blue arrow indicating transparent coating possibly a varnish. (ii) Detail of cross-section in reflected light; a) wooden support; b) glue-size; c) lead & chalk ground; d) clay bole; e) gold leaf; f) varnish.

Fig. 10. General view of cross-section sample STJ 011 (taken from the tunic) in transmitted light X200 mag and SEM-EDS backscattered black and white image of the same cross-section, the red layer consists of a three-layered structure and consisted of a layer of vermilion/cinnabar mixed with small amounts of red lead over an under layer of red lead mixed with red ochre.
of the twelfth century and the first half of the thirteenth century, statues' vestments were increasingly being gilded with gold.\textsuperscript{51} Gold was favoured, as the metal did not tarnish or darken and its lustrous surface was related to royalty and wealth.\textsuperscript{52}

Gilded areas of the tunic were painted red. Analysis confirmed that red was applied in a three-layered structure and consisted of a layer of vermilion/cinnabar mixed with small amounts of red lead over an under layer of red lead mixed with red ochre (Fig. 10). A layer of an organic red glaze, possibly red lake was found between the two red pigmented layers.\textsuperscript{53} The stratigraphy of the polychromy of the tunic matched Cennino Cennini's description of the method used to paint red draperies over burnished gold, as well as the use of vermilion and then of lac (lake pigment) to darken the colour.\textsuperscript{54} The multilayered red colours found over the gilding indicate that some form of decoration was present on the mantle.\textsuperscript{55}

The latter is most probably original to the sculpture as it was common during the Middle Ages to decorate robes either by painting designs on the burnished gold leaf, or for sgraffito to reveal the underlying gilded surface.\textsuperscript{56} The tunic's lining was of a light blue colour\textsuperscript{57} while the girdle around the waist appears to have been green.\textsuperscript{58}

A thick lead white priming layer has only been identified over the ground layer of the sample taken from the sheep's fleece. This priming served as a reflector and whitening layer for the subsequent thin layer of bone white, a pigment prepared by burning animal bones.\textsuperscript{59} The pigment is scarce in density and opacity and hence was not commonly used during the Middle Ages.\textsuperscript{60} The pedestal was painted in blue with a mixture of lead white and probably cobalt blue, the layer of ground was absent or lost during grinding therefore it can not be said if the blue is original.

From the surface texture and smooth modelling of the paint it appears that an oil-based technique was used. Staining tests on the paint layers indicated that the binding media is a mixture of proteins and oils. The oil appears to be tempered with the addition of egg yolk, or animal glue, probably to achieve a stiff paint layer, which was also suitable for sgraffito, or to produce raised decorations over the tunic.

\textsuperscript{52} D.V. Thompson, The Materials and Techniques of Medieval Painting, New York 1936, 190.
\textsuperscript{53} This layer appears peculiar due to its inconsistency and varying thickness and appears to have been applied straight after the application of the first layer of red.
\textsuperscript{55} The execution of the polychromy of draperies in multilayers was common practice in medieval times. M.D. Marincola, and J. Soutarian, 'Monochromy, Polychromy, and Authenticity: The Cloisters' Standing Bishop Attributed to Tilman Riemenschneider', in Painted Wood, History and Conservation, eds. V. Dorge and J.C. Howlett, The Getty Conservation Institute, Los Angeles 1998, 281.
\textsuperscript{56} Cennini, Thompson, tr. 1960, 85-87.
\textsuperscript{57} The composition of the blue layer is not known as no SEM-EDS analysis was carried out on the sample due to technical problems in the instrument.
\textsuperscript{58} The girdle was not sampled. The colour was only observed visually.
\textsuperscript{59} G.R. Rapp, Archaeomineralogy, Berlin, 213.
\textsuperscript{60} Thompson 1956, 95.

However, the results for the binding media were inconclusive.\textsuperscript{61} Pigments with an oil medium were used to prepare glossy polychromed surfaces, a technique used in northern Europe since the thirteenth century.\textsuperscript{62}

### 4.4 Past Interventions

It is evident that several interventions have been carried out on the statue in the past. The only known restoration treatment was carried out in the 1960s by artist and restorer Oscar Testa. Testa had treated the statue against an insect infestation. Several observations regarding past interventions have been made:

- Wood infestation\textsuperscript{63}, cracking and the separation of glued pieces of the sculpture had necessitated restoration treatment in the past. Judging from the thickness and unevennes\textsuperscript{64} of the gesso, the intervention had been inexpertly carried out. The gesso infill material was composed of calcium carbonate and animal glue and was applied over the polychromy (Fig. 11). The infill is of sedimentary origin due to the presence of microfossils.
- At one point, the panel at the back had been removed and re-attached, as two modern manufactured wire nails\textsuperscript{65} were used on the top horizontal edge of the panel as confirmed by X-ray Radiography.
- Other modern manufactured wire nails were visible on the X-rays; this indicates that some form of structural repair was carried out.
- The sheep is bent forward and, judging from the thick gesso infills found between the sheep and the torso, it was at one time either detaching itself from the sculpture, or was removed on purpose during a restoration treatment.
- The right hand is probably not original to the sculpture. This

![Fig. 11. Detail of cross-section sample from the flash tone (STI 010) showing the layer of dark brown coating and the thick infill layer found over the polychromy.](image-url)
was deduced after comparing its carving technique and level of craftsmanship with the left hand. This is further supported by the fact that a different type of wood was used.

- The sculpture was coated with a dark brown substance, which totally obscured the original surface of the polychromy and gilding. Stratigraphic investigations revealed that two irregular layers of brown coating are present on the sculpture, and were probably applied in separate interventions.

- From the EDX analysis it was deduced that both coatings are composed of paint and have a similar elemental composition of iron oxides mixed with carbon and calcium sulphate. Titanium was present with iron oxide on the second layer; however, this does not imply that the colour was applied after the introduction of titanium white in the early twentieth century. Titanium containing minerals are common in rocks and soil therefore their presence in iron oxides is expected. In addition, the two layers did not contain barium sulphate (baryte), a late 19th century additive commonly found in modern paints. This might indicate that both brown coatings were applied before the end of the nineteenth century. However, Hugh Brown wrote in 1946 that the statue was 'covered with armorial graffiti.' The fact that only one is visible today indicates that during a later intervention the graffiti were covered with gesso and a second layer of brown coating. What is certain is that when Hugh Brown reported seeing the graffiti on the statue in 1946, it was already covered with a layer of dark brown coating. This was confirmed by Maria Gambin, who said that she always remembers the statue being brown, but has the impression that when she was young the colour was lighter. This can be explained as the first layer of brown.

- The reason why the statue was turned into a monochrome artefact is unknown, and the following hypotheses are proposed. It could be that most of the polychromy of the statue had deteriorated and, after an intervention on the support, it was decided to coat the statue in one colour to conceal the gesso infills and the ruined polychromy. The monochrome overpaint possibly sought to give the statue a uniform aesthetical appearance. However, it was common procedure in past restoration interventions on polychromy sculpture to apply a new polychromy to restore the artefact's artistic potential. This could mean that the application of the brown coating, rather than that of a new polychromy, was not applied merely as a means to 'camouflage' the sculpture's restoration interventions. It was probably applied to adapt the sculpture to what was popular in a certain period in history. In Italy throughout the 1700s, some examples of wooden polychrome sculpture were coated in a dark brown colour to make the sculpture look like it was made of bronze; which was regarded as a more prestigious material than wood. Therefore, it could be the case that the statue of St John the Baptist was coated to look like bronze.

4.5 State of Conservation

Taking into consideration the statue's past history, particularly its brief stay in the Grotto of St Paul in Rabat, the statue has been exposed to very humid environmental conditions, which had a deleterious effect on the sculpture.

4.5.1 Wooden support

The state of conservation of the wooden support of the statue can be considered as good, being structurally stable and complete. The only loss of original sculptural form appears to be the right hand, which had been replaced including the staff. A minor number of cracks were also found on the sculpture, which appeared to have been infilled in the past. Both open joints and cracks are due to the shrinkage and swelling of the wooden support because of ambient changes in temperature and humidity. Moreover, cracks could have been formed due to the metal nails present, which can split the wood as they are driven in thus making the area fragile. This can result in the development of cracks. However, it appears that the effects from shrinking and swelling are limited, and this is predominantly due to the hollowed interior core of the statue, which drastically reduced deformations and cracks. The more relevant damage, which is probably concealed by gesso infills, seems to pertain to an insect infestation, as there are insect flight holes on the interior of the sculpture and in some other areas on the outer surface. The infestation does not appear yet to have led to any significant damage.

66 The coating in some areas on the statue appeared glossy this may indicate that a varnish was mixed with the paint or applied over the paint.
69 See footnote 23.
70 Ms Gambin is 86 years old.
not seem to be active and was most probably caused by the common furniture beetle *Anobium* sp. The humid environmental conditions to which the statue was subjected in the past might have also caused other types of biological deterioration such as fungal rot; traces of the latter were visible on the left corner of the base.

4.5.2 The Polychromy
The state of conservation of the polychromy of the statue could not be assessed as a whole since it has been concealed. However, where areas of dark brown coating have thinned one can see that widespread polychromed areas are still present underneath. The stratigraphic investigations revealed that the original polychromy is still present underneath the coating. Furthermore, no detachments were visible during the stratigraphic analysis between the support, ground layer and paint. However, since the statue was most probably subjected to unstable relative humidity during its brief stay in St Paul’s Grotto in Rabat, it might have experienced swelling and shrinking of the support, and the polychromy and gilding in other areas might have been affected and probably lost. Apart from natural causes, the polychromy evidently suffered from past restoration interventions, as discussed earlier. For these reasons, the polychromy is not in a good state of conservation. Conversely, the dark brown coating has acted as a barrier, preventing further deterioration or the stripping of the surviving polychromy by insensitive restorers in the past.

5. Conclusion

The construction technique of the statue conforms to the medieval approach to wood carving. The main body was carved from a wooden trunk, the back was hollowed out and the cavity covered with a wooden panel. The fact that walnut wood was used gives us an indication that the sculpture might be of a French origin, considering that walnut wood was mostly used for sculptures originating from this region. Buhagiar has also suggested that it could be of French origin. Additionally, the pigments found on the statue, including vermilion/cinnabar, ochre, minium, hematite, copper green, bone white and lead white were all used during the Middle Ages. Other medieval pigments such as ultramarine, indigo, azurite and orpiment were not identified.

77 No signs of new insect flight holes appeared and no insect frass deposits were noted below the statue, therefore the infestation is not active. However it might also be the case that an insect infestation could be present deep inside the structure and thus not visible.
80 However, their presence is not excluded especially that of ultramarine or indigo since the blue found on the sample from the tunic’s lining was unfortunately not analysed by SEM-EDS.

From non-invasive investigations and the number of samples analysed, it was also possible, to a certain extent, to visualize the statue’s original appearance. The flesh tone was of a salmon-red colour. The tunic was gold and red on the outside and blue on the inside lining, with the girdle at the waist painted green. The red paint found over the gilding suggested that some form of decoration was present in some areas of the tunic. It appears that the central part of the tunic from the camel’s face upwards was gold while the outer areas of the tunic had red decorations painted over the gilding, which was also found at the back. The sheep was greyish white while the base was green, to resemble grass and the pedestal was blue.

The extensive use of burnished gold leaf over the tunic indicates that a high aesthetical value was given to the surface decoration of the statue. It should be noted that a cheaper substitute for gold could have been used. The application of gold leaf at the back of the sculpture indicates that the statue was intended to be viewed in the full round. This further supports Buhagiar’s theory that the statue was not a fixture in the cabin or the stern of a ship, but was probably one of the cult statues inside the ship’s chapel.

The statue has probably undergone many interventions. The wooden support is not frail and the structural integrity of the figure is complete, with the only major loss of original form in the right hand and staff, both of which are probably not original to the sculpture. In turn, the polychromy of the sculpture, which once defined the form of the artefact, is not in a good state of conservation considering the extensive use of gesso and the fact that the polychromed surface has been totally concealed with the dark brown coating, giving a wrong perception of the original appearance of the statue. Hypotheses were presented in the discussion relating to this main restoration intervention. The most plausible one was that the brown coating was possibly applied to make the statue look like it was made out of bronze.

The scientific examination of the statue provided evidence of the presence of original polychromy underneath the dark brown coating. These results will be useful for a subsequent conservation and restoration treatment of the statue. Although valuable information was gathered, the study cannot be considered sufficient for the understanding of the statue as a whole and for a possible implementation of a future conservation methodology. Some aspects need additional investigation; therefore the findings discussed in this study may be considered as a foundation for others to proceed further.

82 Such as the use of imitation gold yellow glaze on silver leaf), silver leaf, copper or tin. I.C. Sandu et al., 2010, 49, 52.
83 Nevertheless, the closed hand and staff are most probably of the same form as the ones originally present on the statue, as St John the Baptist is very often portrayed with an outstretched arm holding a staff.