

Examination of lacquer layers on a 16th-century missal stand

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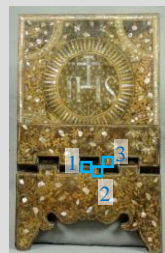
Background In 2017, the Asian Civilisations Museum (ACM), Singapore acquired from a private collection in Portugal a book stand that originally served as support for a Jesuit missal or Mass book. The missal stand is a typical example of lacquered objects that were frequently traded between Japan and Portugal in the 16th and 17th century and often referred to as “Namban” ware. However, decorative features on the stand cast doubt to its authenticity as “truly Namban” and suggest that the place of origin might have been China or South-East Asia (SEA) instead of Japan.

Objective & Methods To gain more clarity on the artefact’s provenance, a multi-analytical approach combining surface examination of manufacturing technique and material characterisation (Cross-section microscopy, FTIR and Py-GC/MS with TMAH derivatization [1]) was conducted.



Fig. 1. Missal stand 2017-01084, Collection of the Asian Civilisations Museum, Singapore

The Missal Stand A foldable wooden board is covered with black lacquer and extensive décor of mother-of-pearl inlays and ornaments gilded in one uniform gold tone. This distinguishes the object from Japanese “Namban” ware which is usually decorated in two different gold tones. The gilding technique appears to be similar to the Japanese makei technique: The outer line of the décor is drawn with a very fine gold line and then filled with a thin layer of lacquer on which the gold is applied.



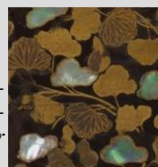
Left: Fig. 1. Missal stand, folded, front.



Right: Fig. 3. Missal stand, folded, back.



Left: Fig. 4. Detail of the missal stand's gold decoration at the front with one single gold tone.



Right: Fig. 5. Detail of chest 2014-00702, Collection of the Asian Civilisations Museum. Namban décor with two gold tones: light and dark.

Surface Examination

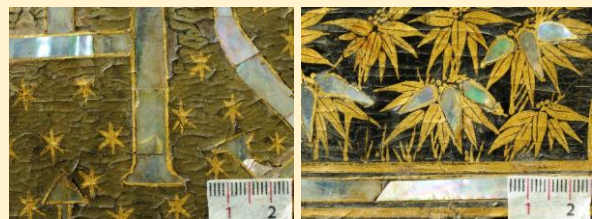


Fig. 6&7. The yellowed lacquer areas at the front are mostly cracked into smaller cubes whereas the better-preserved area covered by the book rest (Fig.2) is dominated by long parallel crack lines.



Fig. 8. The crack pattern at the back is much finer compared to the front.

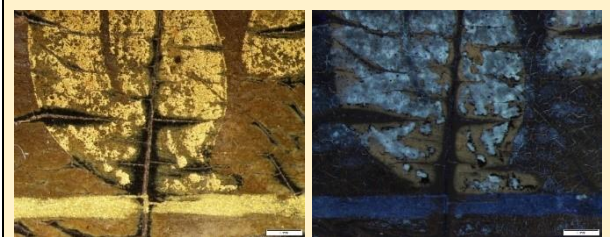


Fig. 9&10. Detail of a gilded leaf at the front in visible & UV light with thin outer line, lacquer base inside and gilding on top. The yellowed black background does not show any strong fluorescence (layer F) whereas the lacquer base inside the leaf fluoresces in dark orange (layer G). The white fluorescence on top belongs to a later, synthetic coating (layer I). The gold line at the bottom is a later restoration.

Samples

Cross-section of Sample 1 (Front)

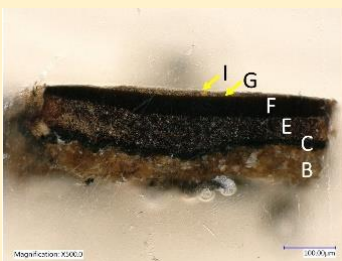


Fig. 11-14. Cross-sections of Sample 1 from front and 4 from back of Missal Stand in visible (left) and blue (right) light. Front pane shows two thick layers E and F, while back pane shows only one thick layer F.

Cross-section of Sample 4 (Back)

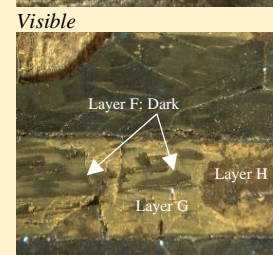
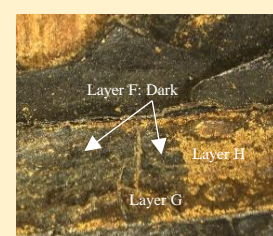
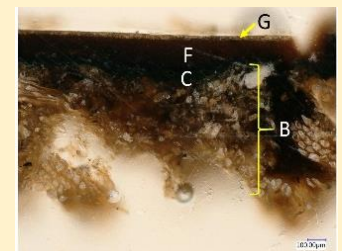
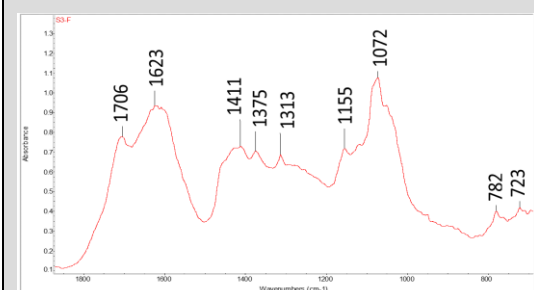
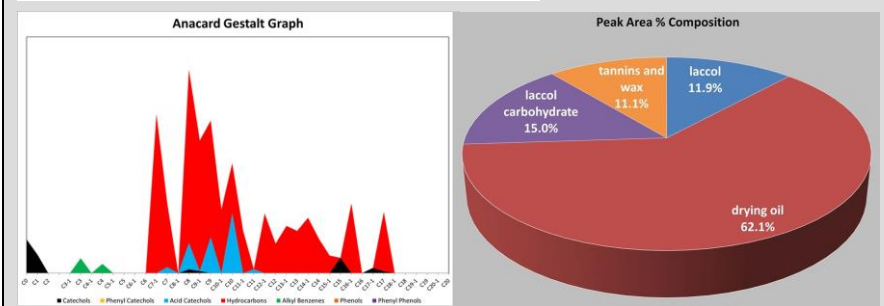


Fig. 15&16. Excavation of lacquer layers for scientific analysis: gilding and foundation have been partially removed and can be distinguished by their different fluorescence.



Left: Fig. 17. FTIR results Sample 3, layer F: Lacquer

Bottom: Fig. 18. Py-GC/MS results Sample 3, layer F: Laccol, drying oil, laccol carbohydrate, tannins and wax



Results of Cross-section Staining, FTIR microscopy, THM-Py-GC/MS

Layer	Name	Staining results	FTIR result	THM-Py-GC/MS result
I	Later coating	Positive staining with Amido Black, Nile Blue and Sudan Black suggests for oil and protein	Oil and maybe protein	Insufficient sample, not tested
H	Gold gilding	Negative staining.	G+H: Lacquer	laccol, drying oil, laccol carbohydrate, tannins, wax
G	Thin brown layer, fluoresces orange	Positive staining with Nile Blue and Sudan black, but not Amido black, indicates presence of oil	Lacquer	Laccol, drying oil, laccol carbohydrate, tannins
F	Thick dark brown layer	Negative staining. Difficult to detect since the layer is dark brown in both vis and blue light	Lacquer	Laccol, drying oil, laccol carbohydrate, tannins, wax
E	Thick granulated dark brown layer, fluoresces orange	Positive staining with Nile Blue and Sudan black, but not Amido black, indicates presence of oil	Lacquer	Laccol, drying oil, laccol carbohydrate, tannins
C	Thin black layer	Negative staining. Difficult to detect since the layer is black in both vis and blue light	Lacquer, Protein	Laccol, drying oil, blood, laccol carbohydrate
B	Light brown ground layer	Positive staining with Amido black, Nile Blue, Sudan black suggests for oil, protein. Appears slightly darker with Lugol's solution, not clear if starch is present	Protein, Kaolinite	Drying oil, pine, blood, starch, laccol carbohydrate, paper, tannins

Results and Discussion The lacquer stratigraphies, gold décor and material composition of the missal stand closely resemble that of “Luso-Oriental” or “Luso-Asian” objects (gold leaf decoration on black lacquer), rather than “Namban” lacquer [2, 3]. E.g. the detection of laccol as the main lacquer component on the missal stand differs from Namban ware, which usually contains urushiol or thitsiol. It is possible that the “Luso-Oriental” lacquer of the missal stand is associated with East Asia (China, Japan, Korea) rather than SEA, as its foundation layers consist of protein instead of lacquer [2,3]. In combination with above results, the missal stand’s lacquer layers, mainly composed of laccol and drying oil, posits for a Chinese ware manufactured for export:

- A laccol/ drying oil mixture has been described as a typical composition for Chinese export lacquer, in contrast to the use of urushiol in chinese lacquered products for the domestic market [4,5].
- Addition of oil to laccol to further increase the gloss has been associated with reduced production time that benefits profitable export [5].

The high content of oil might have contributed to the substantial crack formations found on the missal stand today (Fig. 6-8) [5]. A closer comparison of condition with other “Luso-Asian” lacquer objects would be beneficial to gain more insight on the mechanisms of lacquer degradation for this group of artefacts.

Conclusion Our analysis shows that the missal stand is not truly “Namban” and is better represented as “Luso-Oriental” lacquer associated with East Asia.

Although the place of origin cannot be confirmed at this point, the lacquer analysis suggests that the missal stand belongs to a larger group of objects connected to Chinese lacquer craft and early Portuguese trade routes in Asia.

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Sources of photographs and illustrations:

Fig. 1-4, 6-10, 15-16, 19-20: Birte Koehler, HCC/NHB. Fig. 5: Alex Soo, HCC/NHB. Fig. 11-14, 17-18: Lynn Chua, HCC/NHB

