Characterization of the terracotta sculptures from the Monastery of Alcobaça and the Cathedral of Santarém: comparative study

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Terracota sculpture in Santarém and Alcobaça

Although the terracotta sculpture appears consistently along Portuguese art history, it's during the Baroque that achieves significance in terms of quantity and scale.

The Monastery of Alcobaça encloses a vast collection of valuable monumental terracotta sculptures [1]. That region has been, throughout history, a major ceramic producer and in the 17th century arises as an important production and exportation center. The terracotta sculpture collection is formed by five groups: The Sanctuary (1669-1672); The Redeemer Chapel (1670/80); The main altar figures (1676); St. Bernard Transit (1687-1690) and The Kings (1675-1678 and 1762-1765). The project "TACELO: **Estudos para a conservação das esculturas monumentais em terracota do mosteiro de Alcobaça"**, aims to mitigate the degradation that some of the terracotta sculptures present.

In Santarém, a set of five terracotta sculptures, also baroques, is located in the main façade of the Church of Our Lady of the Immaculate Conception of the Jesuit College, the city's cathedral. They were produced around 1711 [2] and represent four Jesuit patrons (Saint Francis Borgia, Saint Ignatius, Saint Aloysius Gonzaga and Saint Francis Xavier) and Our Lady of the Immaculate Conception.

Fig. 1- Jesuit paatron, Santarém.

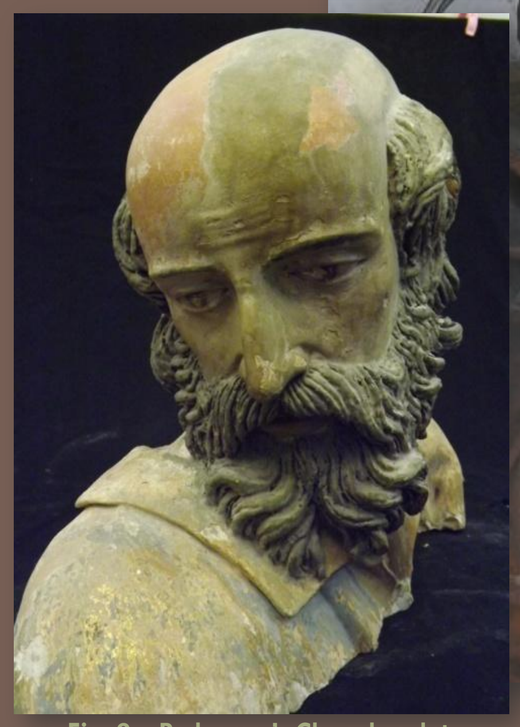


Fig. 2 – Redeemer's Chapel sculpture, Alcobaça.

Fig. 3 – When sculptures presented repaints, small areas were cleaned in order to see the original polychome.

Fig. 4 – Collection of samples in Alcobaça; this was carried out by IPT students, from the Master in Art Conservation and Restoration, in colaboration with Project Tacelo.

Goals and methods of investigation

This study aims to compare the sculptures from both cities, regarding the ceramic body, microstructure and manufacturing techniques.

Samples were collected from the terracotta sculptures in order to obtain their characterization trough mineralogical analysis (XRD), chemical analysis (XRF) and physical tests (open porosity, water absorption and specific gravity).

The conformation processes were analyzed though visual observation and compared with the known coeval treatise.

Conformation study

Regarding the conformation process, both present similar major diameters, same internal framework structure and figurines with height around 2m. Although in Alcobaça two different sets with small variations in the techniques can be identified, the general features are consistent with the techniques described in "Artefactos Symmetriacos, e geometricos, advertidos, e descobertos pela industriosa perfeição das Artes, Escultuaria, Architectonica, e da Pintura", by Padre Inácio da Piedade Vasconcelos. The sculptures were erected with an internal frame, cross shaped, and with as many hollow spaces as possible to enable a good drying and uniform firing. Several holes were created to improve those same processes. Other kind of holes, only visible when the sculptures are dismantled, where detected and, according to Padre Inácio, were caused by the use of canes during the sculpting process, so that the sculputures wouldn't colapse. After the sculpture was completed, it was sectioned in "tacelos", by using a wire. The marks caused by the cuting are still visible.

After the firing they were assembled in their final locations, the "tacelos" were settled and the surface covered with plaster and decorated with "estofado" technique.

In Santarém the sculptures were sectioned in less "tacelos" (from 5 to 6) than in Alcobaça (from 7 to 12). They have at least one repaint, so the original decoration is not visible.

Some features, not mecioned by Padre Inácio, are also common in both cities, like the separated modelling of the hands, with later attachment.

Fig. 5– Sculpture with the tacelos assembled (Alcobaça).

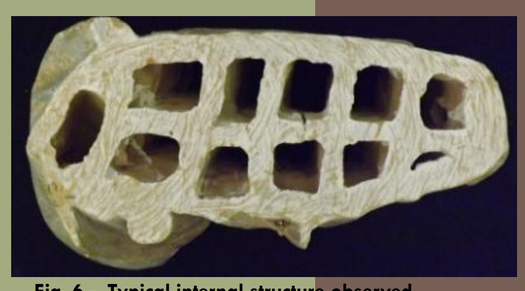


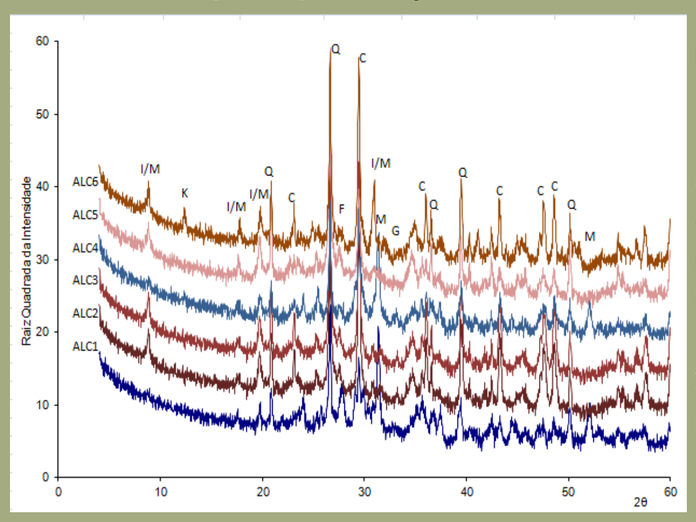
Fig. 6 - Typical internal structure observed.

Fig. 7 - Hole created for hand placement.

AMOSTRA	SiO2 (%)	Al2O3 (%)	Fe2O3 (%)	CaO (%)	MgO (%)	K2O (%)	Na2O (%)	TiO (%)	P.R. (%)
ACL1	46,18	19,08	5,92	17,74	1,94	3,44	0,23	0.65	4 ,3 4
ACL2	39,10	16,34	4,28	16,08	2,47	2,61	0,18	0,52	17,57
ACL3	52,04	18,24	5,05	14,68	1,65	2,82	0,20	0,73	12,30
ACL4	37,64	15,79	5,13	20,85	2,65	2,71	0,17	0,50	11, 64
ACL5	50,84	20,19	5,13	9,96	1,61	2,43	0,22	0,74	6 ,8 2
ACL6	37,42	15,88	4,02	13,73	2,58	2,40	0,14	0,54	19,25

Tab. 1 - Chemical amalyses (Alcobaça).

Graf. 1 - Mineralogical analyses (Alcobaça).



Tests and analyses

The Alcobaça's samples minerology consists mainly in quartz and calcite. The chemical analyses though XRF revealed that the samples vary in their SiO2 and CaO content.

Open porosity results present a similar relation, reverse of the specific gravity and are typical of calcitic clays.

Samples from Santarém are currently being processed.

ALC-1 was collected from the redeemer's chapel; ALC-2 from Saint Bernard Transit; ALC-3 from the main altar (Virgin); ALC-4 from the Sanctuary; ALC-5 from the Nativity Scene; ALC-6 from the main alter (angel).

Conclusions

The formal differences between the cities show clear individualized artistic production, while the resemblances lead us to foresee the adoption of similar same conformation and firing techniques. Regarding the Alcobaça's sculptures we can already say that they are produced from calcitic clays and fired in an environment that didn't allowed homogeneous temperatures. The physicall properties are within the expected parametres. The conformation techniques correspond to the ones described in the known teatise.

Acknowledgments

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