

## Abstract

An eighteenth-century Chinese wallpaper was studied according to its manufacture as well as its conservation state aiming to propose the most appropriate conservation and restoration procedures. This rare and unique piece found in Portugal belongs to the so-called *Bird Room*, from a private property in Quinta da Francelha, Prior-o-Velho.

The materials and techniques were studied by  $\mu$ -EDXRF,  $\mu$ -FT-IR and  $\mu$ -Raman. The main pigments were white lead, organic red (possibly lac dye), vermillion (HgS), haematite, goethite, malachite, azurite, Prussian blue, indigo and bone black. The binder applied, according to  $\mu$ -FT-IR analyses, was starch paste. Moreover, the fibres in the paper support were identified as being kozo, ramie and hemp. The material characterization was also complemented by the research made by the Center for Atomic Physics in the Faculty of Science of the University of Lisbon (FCUL).

Some of the materials applied in past interventions were also identified, which included the adhesive PVAc (polyvinyl acetate); a mechanical woodpulp paper (such as journal), used for fillings; and a green earth pigment.

A new technique for paper stratigraphies was developed, with a coat of Klucel E between layers of acrylic resin, to avoid the impregnation in the paper samples. Lugol and sypro solutions were used to identify starch and proteins, respectively. The presence of three different papers attached with starch paste was observed by optical microscopy.

The diagnosis concluded that the wallpaper is in a fairly unstable condition, mostly because of the bad isolation of the building that deeply influenced the degradation of the paper and the binder. The restorations carried out in previous years have aggravated its current state, mainly because the materials applied were not the proper ones. For a future intervention it is proposed the creation of a multidisciplinary team to approach the problems in an integrated manner, by repairing the infra-structure of the room, the main source of deterioration of the paper and then by restoring the paper, *in* and *ex-situ*, with adequate and stable conservation materials.