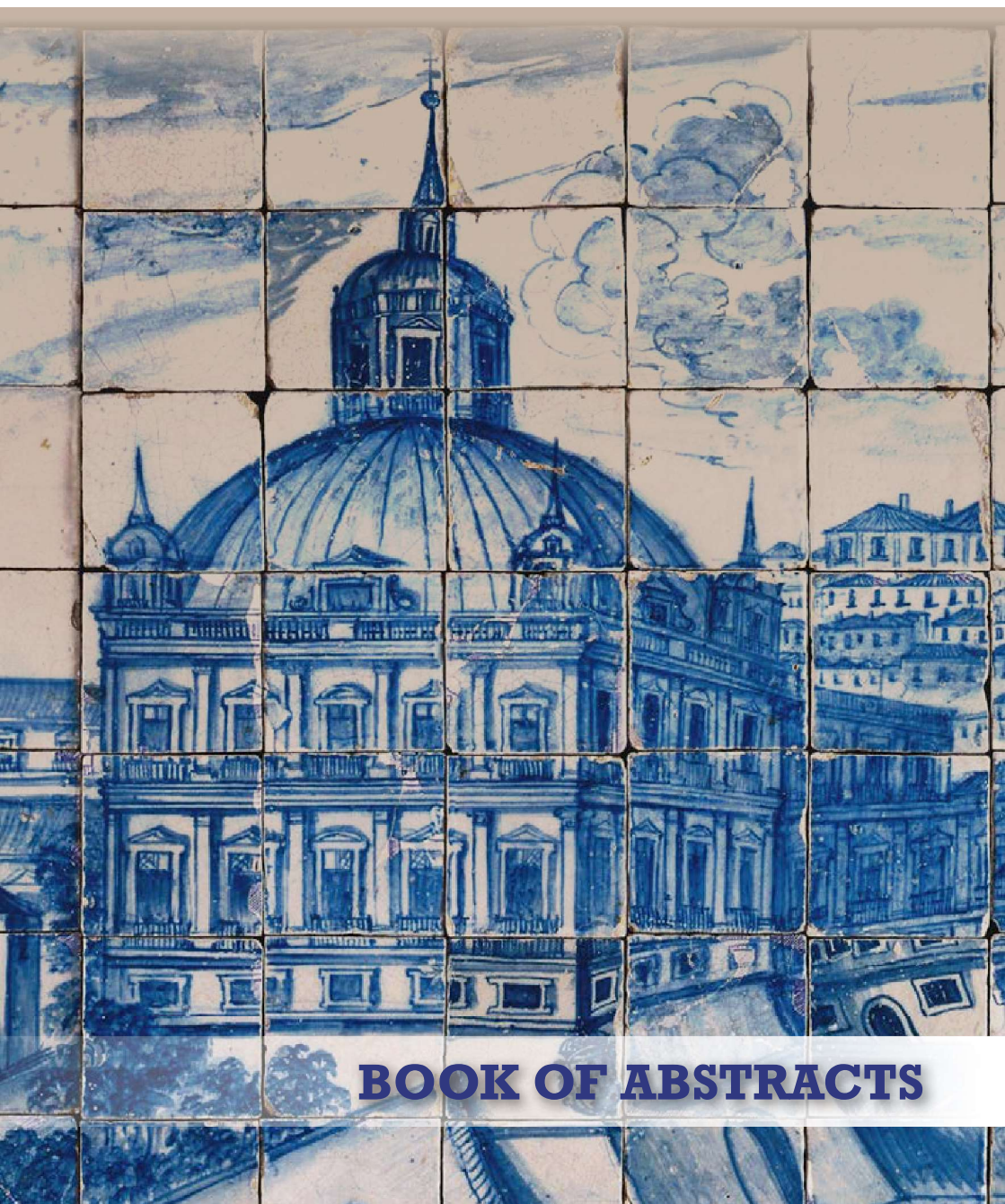




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on analytical techniques
in art and cultural heritage
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BOOK OF ABSTRACTS

TECHNICAL INFORMATION

TECHNART2023 BOOK OF ABSTRACTS

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NOTE

Authors are responsible for the text included in the abstracts, for the reliability and truthfulness of the information and for the rights to publish any material included in the text

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Microbial induced stone discoloration in Alcobça Monastery: a comprehensive study

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The Alcobça Monastery (Portugal), a UNESCO World Heritage Site, currently exhibits a high degree of surface alterations of the stone architectural elements inside the church, including an extensive pink coloration in the walls and columns (Fig. 1 A-B), bacteria biofilms, and salt efflorescences (Fig. 1C). The main goal was to identify the microbiota that colonizes the walls and columns of this monument, to help custodians and conservators-restorers in the selection of the correct cleaning procedure to be adopted for the conservation of the monument.

Regarding the observed pink discoloration, and considering previous studies, we hypothesized that it is caused by biofilms formed by bacteria or other microorganisms that produce pigments of the same color, particularly carotenoids. Curiously, a distinct phenomenon was noticed (Fig. 1A): the pink discoloration always seems to appear at a very similar height in most of the columns and walls, starting at 40 cm to the floor and associated with the presence of salts on the walls. Using high-throughput sequencing approaches, we were able to characterize the microbial community present. We identified several bacteria that are producers of pink pigments and halotolerant such as *Bacillus aryabhatai*, *Rubrobacter radiotolerans* and *Halalkalicoccus* sp. and thus develop in areas of high salinity [1-4].



Figure 1: (A) distinct phenomenon observed at the altar of the monastery church; (B) pink colored biofilms on the walls; (C) evidence of the presence of salts on the walls.

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