

Disclosing medieval Iberian iron-gall inks recipes through the use of historically accurate reconstructions

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Abstract

Iron gall ink is one of the most important inks in the history of western civilization and it was in widespread use from the middle ages until the beginning of the 20th century. The degradation of manuscripts, catalyzed by iron-gall inks, is a major conservation issue and a serious threat to the world written heritage [1].

We have prepared five medieval inks using the same ingredients and similar methodologies. They are the result of research into Iberian written sources of medieval techniques and three basic ingredients are constantly described in these recipes: Fe²⁺ obtained from an iron sulphate salt, a phenolic extract (tannins), usually from gall nuts, and a binder, gum arabic [1,2]. Other metal ions and different additives such as pigments, as well as different extraction conditions, were tested. These variations were studied and its contribution to the specific ink recipe was revealed [3].

All the extracts and inks were analyzed in threefold by HPLC-ESI-MS and HPLC-DAD. The first allowed the identification of the phenolic compounds present both in extracts and inks, while the second allowed the quantification of these compounds [3]. Therefore, this work allowed for the identification and quantification of the major phenolic compounds present in the gall extracts, while evaluating its variation by the addition of an iron sulphate salt and gum arabic when producing the iron-gall inks. Moreover, it was also possible to identify and quantify the effect of each additive on each tested recipe.

Acknowledgements: We thank the Fundação para a Ciência e Tecnologia for financial support: FCT-MCTES project PTDC/QUI-OUT/29925/2017 for the contract REQUIMTE/EEC2018/PTDC/QUI-OUT/29925/2017 and UID/QUI/50006/2019 with funding from FCT/MCTES through national funds.

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