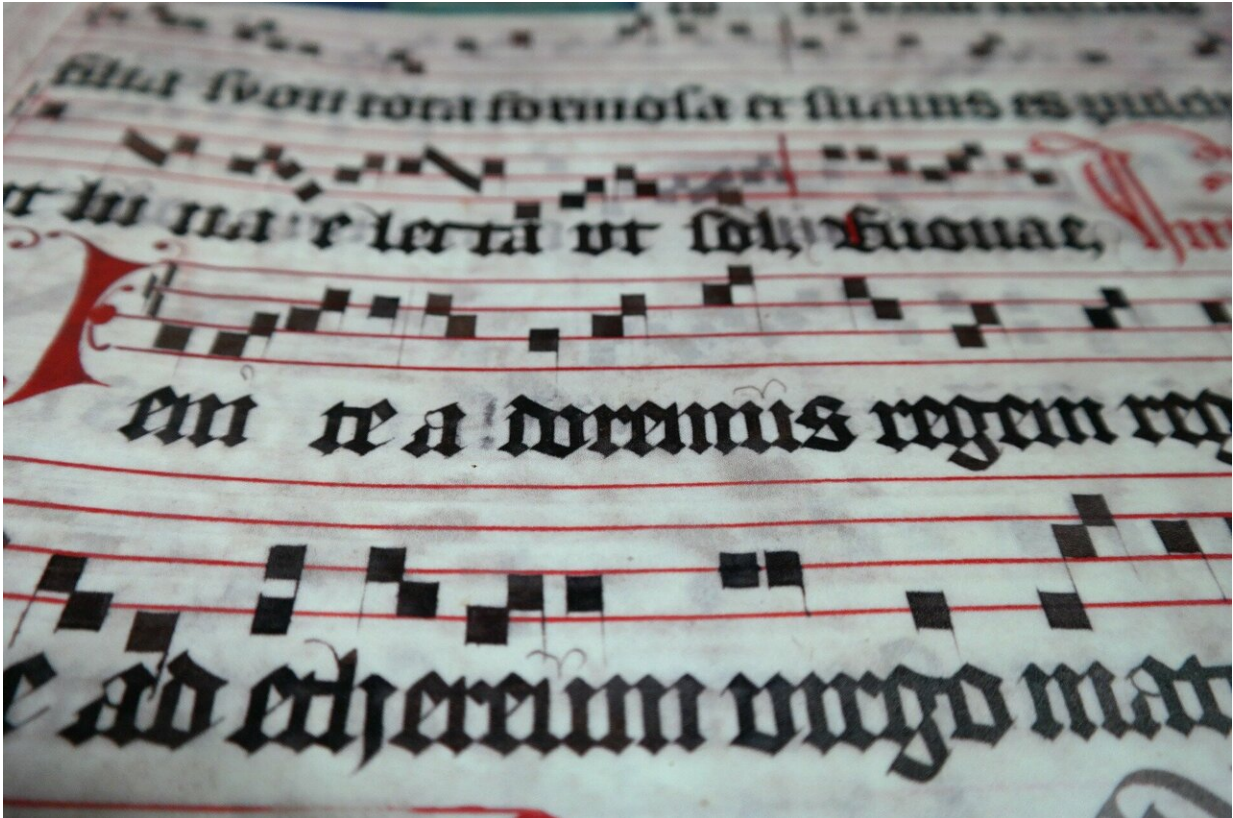


Medieval inks for heritage conservation

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The fact that historical archives, libraries, museums, writing workshops and even monasteries, currently conserve medieval manuscripts is not only a question of heroes or ordinary people who went through the trouble to save them, passing them down from one generation to the next, or who hid them so they would not be destroyed. The materials

used to write and draw upon paper were crucial so that surviving written texts can be read, translated and interpreted nowadays.

Figuring out the [chemical reactions](#) of the components that made writing on paper possible and last for hundreds of years was the aim of the Meridies Medieval History research group at the University of Cordoba. For months, this group has focused its work on these chemical reactions in collaboration with chemists at Nova University Lisbon.

This team, headed by University of Cordoba Medieval History Professor Ricardo Córdoba, carried out the duplication of five medieval inks, using each and every 15th and 16th century ingredient and method to do so. How did they do it? By analyzing handwritten [recipes](#) for making ink, painstakingly searching in several parts of the world such as the Bishop Chancellery in Braga, Portugal, where a 1464 [recipe](#) is kept, the School of Medicine Library in Montpellier, with another dated between 1469 and 1480, as well as the Historical Archive of Cordoba Province, dated 1474.

These five unpublished documents allowed for replicating the five inks. Pomegranate peels, galls used by plants for defense against parasites, vitriol, water, and gum arabic made from recipes using animal skins, are some of the ingredients that make up these inks and the ones that researchers mixed in the exact same quantity, proportion, temperature and method as indicated in the medieval recipes, and with which it was possible to replicate the exact same inks as the ones used six centuries ago.

The results of this collaborative research between historians and chemists were recently published in the journal *Heritage Science*. This research included translations of the texts and procedures outlined in the medieval recipes, the making of the inks following the step-by-step directions contained in the recipes, and the analysis of the chemical

reactions of these ingredient combinations, with the aim of finding keys to conserving written heritage. By means of exact replication and analysis of inks used in the Middle Ages, researchers can determine which treatments historical documents should undergo in order to recover and improve their current condition and, above all, ensure that they will physically last longer.

More information: Rafael Javier Díaz Hidalgo et al, New insights into iron-gall inks through the use of historically accurate reconstructions, *Heritage Science* (2018). [DOI: 10.1186/s40494-018-0228-8](https://doi.org/10.1186/s40494-018-0228-8)

Provided by University of Córdoba

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