

Exploring the consolidation properties of nanocellulose for cut and ripped paper restoring

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During the last decades the worrying situation of climate changing lead to the research of alternative and eco-friendly solution to reduce environmental risks issues in different fields. In Cultural Heritage conservation context, the use of natural products is constantly increasing in order to preserve both environment and workers.

This work is focused on the investigation of the potential of nanocellulose for consolidation purpose when cut ad rips on paper have to be restored. Nanocellulose showed encouraging results on cellulosic substrates due to its chemical affinity, biocompatibility and renewability. All these characteristics make this natural product a great new entry in material for conservation field.

In particular, in this research the attention is concentrated on the use of nanocellulose as promising material for consolidation purposes on Japanese prints.

Usually, the common restoration practices used for the consolidation on paper substrate for this kind of problems, includes the use of small pieces of paper applied with adhesive products. This practice can affect the transparency of paper itself and this condition should be avoided when working on Japanese paper itself. In fact, the transparency is one of the main characteristics of paper Japanese artefacts and it must be preserved.

For this purpose, a series of investigation have been performed by testing the application of nanocellulose in different concentration in water and in hydroalcoholic solution (Water/ethanol 50:50) on samples specifically realized by reproducing the artistic technique of Japanese prints. Performances of nanocellulose have been monitored by scanning electron microscope observation to evaluate the repairing ability and colorimetric analysis to highlight the possible comatic interference both on paper substrate and painted areas.