Cellulose nanomaterials for Cultural Heritage: extraction, synthesis, characterization and applications

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Due to their many characteristics such as renewability, sustainability, eco-friendly, the new cellulose nanomaterials are increasingly capturing the attention of researchers in the most different fields of study and application including the field of Cultural Heritage. The aim of this research work was to extract nanocellulose from a natural source, tomato plant residues (TPR), and use it to produce new bio-inspired consolidants for degraded wood. Moreover, a composite material based on nanocellulose (NC) and graphene oxide (GO) was synthesized in order to provide in addition to reinforcement also an ultraviolet shielding action. Therefore, several characterization techniques were used, such as Scanning Electron Microscopy (SEM), Atomic Force Microscopy (AFM) and UV-Vis spectroscopy, to demonstrate the efficacy of the new consolidants obtained, and finally an analysis with sub-micron X-ray microscopy (XRM) was performed in order to evaluate the porosity variation of treated wood.