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Extraction and characterization of cellulose nanocrystals (CNC) from diss and herb alndn of the algerian east mountains

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The development and valorization of biomass is one of the important ways to control the consumption of non-renewable resources and to fight against climate change. This strategy allows us to take advantage of the agricultural and forestry exceptional potential and to offer new opportunities to these vital sectors while creating sustainable activities and jobs. It can be used in various fields where biomass as renewable resources is expected to play an increasing role. The present work is a study of two wild plants (DISS and HERB ALNDN) that are widespread in the mountains of North Africa (more precisely in the Medjounes Mountain of Sétif in Algeria. Diss has been used for a very long time in this zone of Algeria as sources to develop ropes very resistant by simple braiding of the stems of the plant. An particular interest will be focused on the extraction procedures and the characterization of cellulose nanocrystals (CNC) extracted from the cellulosic fraction of these plants. The characterization by light diffraction of the CNC revealed that the particle transverse length varies between 60-190 nm for the CNCD and 220-600 nm for the CNCHA. Fourier transform infrared spectroscopy (IR-TF) was used to highlight the evolution of the chemical composition thus confirming the elimination of Fourier transform infrared spectroscopy (IR-TF) was used to highlight the evolution of the chemical composition thus confirming the elimination of extracellulosic substances during the chemical treatment of the extraction process. Thermal stability was studied by thermogravimetric analysis. crystallinity is evaluated by X-ray diffraction. The zeta-sizer showed that the surface area of the obtained CNCs was negatively charged following the process of substitution of the hydroxide groups by the sulfate groups, during the hydrolysis step with concentrated sulfuric acid. To study the structure, scanning electron microscopy and atomic force analysis, are used.

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