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| **Published Researches**  **الأبحاث المنشورة** | |
| Title  **عنوان البحث** | * Novel Pretreatment Performance Evaluation for Cellulose Nanofibrils Extraction from Ficus natalensis Barkcloth |
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| Abstract  **خلاصة** | * Recently, nanosized cellulose materials extraction is extensively interesting from the sources of sustainable materials. Cellulose nanofibrils (CNF) extraction through green bio-based materials featured as promising interest in the field of science. In this study, dimethyl sulfoxide (DMSO) was applied to examine its effectiveness in pretreating the Ficus natalensis barkcloth cellulose (FNBC) for CNF production before 2,2,6,6,-tetramethylpiperidine-1-oxyl (TEMPO) oxidation. The pretreatment performance of DMSO was evaluated based on the structural and morphological changes. DMSO pretreated FNBC attained the most dramatic morphological changes as compared to untreated cellulose samples. The results of the scanning electron microscope (SEM) and transmission electron microscope (TEM) shows that there is an extensive structural disruption of FNBC during the pretreatment process, which could be because of outstanding ability to eliminate non-cellulosic materials and amorphous regions from the FNBC, confirmed by the X-ray diffractometry (XRD) showing higher crystallinity values, as well as higher thermal stabilities values of pretreated FNBC samples, were also noted. Overall, this study revealed a tremendously effective and pioneer pretreatment method for fractionating FNBC, to stimulate the successive extraction of cellulose nanofibrils. Furthermore, based on the cellulose and CNF characterizations, this study showed that F. natalensis barkcloth could be considered as an alternative source of cellulose for potential value-added industrial applications such as the food industry, paper making, and biomedicines. |