ID 463

Extraction and Characterization of Fibers from *Caryota urens* L. (Kithul) Leaves

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Abstract

Caryota urens L. (Sinhala: Kithul; English: Fishtail palm) is an indigenous plant naturally grown in the wild. Kithul leaf has a high fiber content and could be a good alternative to many fibers with industrial applications. However, extremely limited research has been conducted on this topic. This study focused on extraction and characterization of fibers from Kithul leaf. Kithul leaf samples were collected utilizing a systematic random sampling approach to ensure representative and unbiased selection. Authentication of the plant materials was achieved through rigorous comparison of botanical features. Fiber was extracted by alkali and acid digestion method. Different physical and chemical properties of extracted fibers were assessed using internationally accepted standard methods. Further, characterization of Kithul leaf fibers was performed using Scanning Electron Microscopy (SEM). Results showed significant differences among the tested physical and chemical properties of Kithul leaf fibers. The fiber diameter, length, elongation at break, tensile strength, moisture content, and total lignin content varied from 0.24 ± 0.04 - 0.64 ± 0.16 mm, 29.48 ± 2.36 - 86.91 ± 5.40 cm, 9.14 ± 4.88 - 12.77 ± 4.58 mm, 7.77 ± 2.49 - 45.56 ± 14.60 N, 10.03 ± 0.79 - 13.24 ± 0.50%, and 21.44 ± 0.07 - 28.51 ± 0.03% respectively. Further, Kithul leaf fibers can be broadly categorized as short fibers (2 types namely A&B) and long fibers (2 types namely C&D). SEM images clearly showed the length variations in short and long fiber types of Kithul leaves. It is concluded that fibers with varying physical and chemical characteristics can be extracted from Kithul leaves. These fibers may have many potential industrial applications, thus further studies could be recommended in purification and characterization Kithul leaf fibers.

Keywords: *Kithul leaf fibers, Physical properties, Chemical properties*