

## **Water sources derived bio retting effect on kenaf fiber compositions**

### **ABSTRACT**

Concurrent eutrophication and scarcity of water have made the difficulties for kenaf retting; hence, seawater (SW), freshwater (FW), and municipal wastewater (MTW) were assessed for kenaf retting feasibility. SW retting liquor showed highest  $1.39 \times 10^8$  CFU/mL bacterial loads on the 5th day, compared to FW  $1.30 \times 10^8$  and MTW  $1.25 \times 10^8$  CFU/mL on the seventh days retting period. SW solvents treated retting effluents showed maximum 13.68 U/mL pectinase enzyme activities. Based on un retted raw kenaf fiber (URKF) maximum fiber bundle weight was reported in MTW with 16.04% material losses, while the SW and FW treatments showed 24.38%, and 21.03% material losses, respectively. All solvents treated fiber samples showed smooth and cleaner fibers surface morphology by SEM indicates sufficient non cellulosic gums (NCGs) removal compared with URKF. Moreover, solvents retted fiber and URKF were examined for chemical composition, FTIR, and X-ray diffraction test. Results revealed that compared to URKF, solvents treated kenaf fiber increases 26.26 – 37.75% cellulose portions, and their crystallinity index increases 18.03–30.94% due to NCGs removal. This study's findings indicate that along with FW the alternative macerating solvents SW and MTW were also feasible for kenaf bio retting, which could be a remediation for the mitigation of freshwater shortage.