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A novel enzyme extracted from *Aloe vera* plant used in hide unhairng leather process

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Leather has undergone chemical processing since time immemorial. We are to this day awed by beauty sophistication of leather products sometimes found in archeological excavations. After fabricating the mansions of fashion and comfort, leather products developments are now moving towards high–tech area of performance. This has brought up diversification and the sea change in the chemical processing of leather which was basically unchanged while years. Application of biotechnology in chemical processing of leather is one of the revolutionary ways to enhance chemical processing pinnate right from tanning to final finishing. The plant-based enzymatic process is a groundbreaking technology for the beam house stage of the leather production process. In this research work, an enzyme extracted from the aloe vera plant has developed a completely new, enzyme-based unhairing solution that overcomes current beam house challenges. A paradigm shift from chemical- to enzyme-based processes ensured that these noncollagenous materials were removed using enzymatic digestion rather than brutal osmotic forces employing chemicals like lime and sulfide. In the present study, protease enzyme extracted from aloe vera plant was used as experimental, and a lime and sulfide process was used as the control sample. Unhairing chemical composition was used 50% enzyme/50% lime and sulfide, 100% enzyme and 25% lime/sulfide and 75% enzyme in this trial work. Unhairing of sheepskin has been carried out with Protease enzyme alone at various concentration (5%, 10%, and 20%). The properties of enzymatic unhaired samples are compared with those of the conventional one. Encouraging results in term of fiber opening, excellent hair removal is obtained in case of 25% Lime/sulfide and 75% enzyme.Further, it reduces the volume of effluent as well as BOD, COD, TDS and nitrogen content. Using the enzyme permits a reduction in the chemical dosage and/or process time. The test results have strongly revealed that it is possible to produce commercially acceptable upholstery leather by using the enzyme in hair-save unhairing. The total consumption of lime and sodium supplied was reduced to 1.5% and 1.0%, respectively. Scanning electron microscopy (SEM) images of 25% lime/sulfide and 75% enzyme treated leathers showed the better degree of fiber opening, and an energy dispersive X-ray spectrum (EDS) shows the elements present on the skin matrix. This study provides a newer insight for a cleaner, economical, and sustainable method of leather processing.

Biography

Durairaj Jothi, M. Tech (Textile), PhD (Currently doing), working as a professor in the Department of Textile Chemistry, SSM College of Engineering, Anna University, Tamil Nadu, India. Earlier, he taught at the Bahirdar University, Ethiopia for several years before joining SSM college of Eng in 2012. He has more than 34 years of experience in teaching and conducting various researches in the organic product development for textile, leather and paper manufacturing. He has published more than 24 papers in National and International Journals, and authored two books.

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