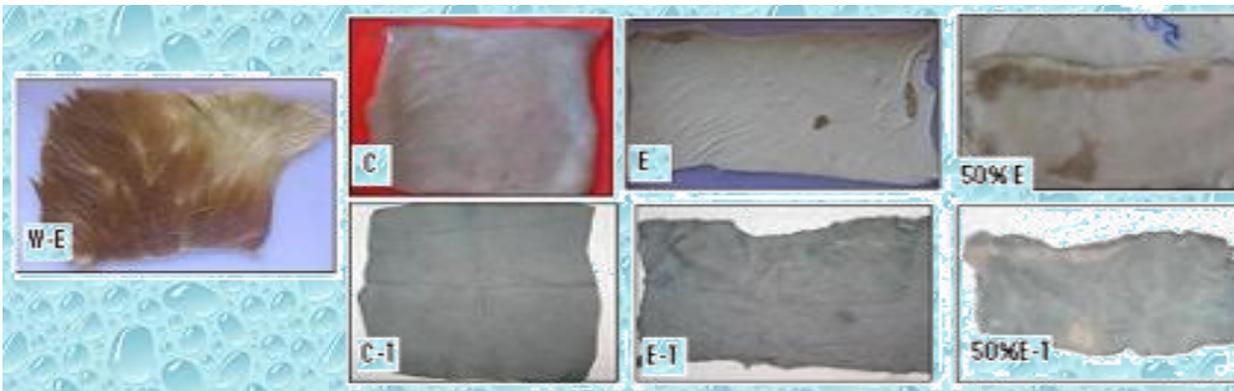


## Enzymatic dehairing of hide at neutral pH

Hair attached to animal hides/skins is removed during leather processing. Conventional processes for leather preparation often involve use of toxic chemicals like lime, sodium sulphide, salts and solvents which pose a threat to the environment. Leather industry has been using proteolytic and lipolytic enzymes in leather processing for the conversion of raw hide into processed leather. Use of microbial proteases in leather processing can reduce the pollution caused by conventional leather processing as well as aid in recovery of good quality leather. Bacterial protease contributes to 70% of industrial enzyme and has widespread application. Proteases find applications at various steps of leather processing, e.g., neutral proteases in soaking, alkaline proteases in dehairing and acid proteases in bating. Microbial protease and lipases from two isolated strains in combination were effective as a dehairing agent in leather processing. The incubation time for efficient dehairing was 10 hours. The cell culture containing extra cellular protease could be reused for dehairing upto 7 cycles. During this period the efficiency of dehairing was maintained. The technology is ecofriendly. Patents were also filed for the same in India (863/KOL/2010 dt August 5, 2010); US (US20120142073 A1) with PCT no.PCT/IB2010/002845; China (201080068487.7(IN-700638-04-CN-NAT) dt 2<sup>nd</sup> May 2013); Europe (IN-700638-05-EP-NAT dt 2<sup>nd</sup> July 2013) and the technology has been transferred to Intellectual Ventures Invention Network. Subsequently technology has been developed for sustained enzyme release from packed bed reactors.



Photograph of dehairing efficiency of the protease with or without tanning. W-E represents the negative control (hide incubated with water without the treatment of the enzyme). C represents the hide treated in conventional chemical 20 method (5% lime + 5% sodium sulphide). E represents the enzyme treated hide. 2% L-E-T represents the enzyme treated hide with addition of 2% lime; the hides were incubated for 16 hours at room temperature. Mild, manual scrubbing results in removal of hair in all the cases. C-T, E-T, and 2% L-E-T represent the dehaired hides of conventional, enzymatic and combined treatment after tanning, respectively.