The investigation of effects of commercial protease and *Bacillus subtilis* 168 E6-5 protease on felting and dyeing behaviour of 100% wool fabric

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In this study, a novel bacterial strain with high protease activity (210 U/ml) was isolated from soil, and then identi ed by its morphological character and 16S rRNA sequence, and named *Bacillus subtilis* 168 E6-5. *Bacillus* protease enzyme and commercial protease enzyme were applied to 100% raw wool fabric and bleached wool fabric. A er dyeing with acid dyes, changes in the size of the fabric and color yields were measured. Protease was puri ed by dialysis+lyophilization, and applied on dyed wool fabric and felting shrinkage values were measured. Enzyme treated and dyed wool fabric possess 8%, however non-treated wool fabric has 11% of felting shrinkage value just a er dyeing step. A er performing ve repeated washing, the enzyme treated raw fabric has 12% and the non-treated raw fabric has 15%. A er pre-washing, bleaching and dyeing steps, the felting shrinkage value of the enzyme treated wool fabric was 9%, while non-treated one was 11%. A er the processes of pre-treatment, bleaching and dying the K/S value indicating the colour yield of the fabric was measued. e K/S value of the wool fabric that was treated with enzyme before the processes of pretreatment, bleaching and dying was 31.68, while the non-enzyme-treated wool fabric has 26.33. Enzyme application increased the colour yield. is study suggests that the *Bacillus* protease enzyme shows better results in behaviours of felting and dying than the commercial protease enzyme and applicable on wool fabrics. erefore, this protease enzyme has potential in textile industry.

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