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Studies on the purification and properties of the collagenase from *Bacillus subtilis* JS-17

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Collagen and its digests have been widely used in protein-based industries as solidifying and emulsifying biopolymers. These polymers are also used in medical and chemical industries to produce skin substitutes, surgical threads and phamacological capsules as well as photographic coating. An extracellular collagenase-producing bacterial strain was isolated from kimchi and identified to be *Bacillus subtilis* JS-17 through morphological, cultural, biochemical characteristics and 16S rDNA sequence analysis. Optimum culture condition of *Bacillus subtilis* JS-17 for the production of collagenase was 1.5% fructose, 1% yeast extract, 0.5% K_2HPO_4, 0.4% KH_2PO_4, 0.01% $MgSO_4 \cdot 7H_2O$, 0.01% $MnSO_4 \cdot 4H_2O$, 0.1% citrate, 0.1% $CaCl_2$. The production of collagenase was optimal at 30℃ for 72 hrs. A collagenase produced by *Bacillus subtilis* JS-17 was purifed 5.2-fold by Amberlite IRA-900 column chromatography and Sephacryl S-300 HR column chromatography. The molecular weight of the partially purified enzyme was estimated to be 28 kDa by SDS-PAGE. The optimum pH of the enzyme for collagen degradation was around 7.0 and stable around pH 6 and 9. The optimum reaction temperature was 60℃ and stable upto 55℃. The enzyme was activated in the presence of 5mM Ba^{2+}, but Sn^{2+}, Fe^{2+} inhibited the enzyme activity. The enzyme activity was inhibited $KMnO_4$, ammonium persulfate and L-cyteine. And the enzyme showed the highest activity when the insoluble collagen (type I) was used as a substrate.