

Abstract 58 – Paper ID: 084**Optimization of Keratinolytic Protease Production by *Streptomyces diastaticus* strain TS1-48**

Amanda Nongthombam¹, Debananda S. Ningthoujam¹

¹Department of Biochemistry, Manipur University, Canchipur, Imphal, Manipur-795003, India

Email: amandanongthombam99@gmail.com

Abstract

Keratinolytic proteases are inducible extracellular enzymes mainly produced by microorganisms in presence of keratinaceous substrates, e.g., feather, wool, nail, and hair. Keratinases are usually serine or metalloproteases that have biotechnological applications in production of feather meal, rare amino acids (serine, cysteine, and proline), or peptides. They also find varied applications in leather, pharmaceutical, and cosmetic industries. The present work deals with keratinolytic proteases produced by *Streptomyces diastaticus* strain TS1-48. Seventy-two bacterial isolates were obtained from feather dumping soil in Taothong, Manipur, of which 41 were found to be proteolytic. These 41 proteolytic isolates were subjected to keratinolytic screening using feather basal medium (FBM). Eleven isolates (TS1C-1, TS1C-3, TS1C-5, TS1C-6, TS1C-21, TS1C-22, TS1C-34, TS1-17, TS1-42, TS1-43, and TS1-48) could degrade chopped chicken feathers, of which TS1-48 was most potent. TS1-48 was identified as *Streptomyces diastaticus* strain TS1-48 by 16S rDNA sequence analysis. It was cultivated in FBM containing 0.5% white feather (30°C; pH 7.5; 96 hrs). In protease assay, using azocasein as substrate (70°C; pH 9), the activity was found to be 98.85 U/mL/min. Production of enzyme at different temperatures, medium pH, feather concentrations, C and N sources, and inoculum percentages was then evaluated. The best production was achieved at 30°C, pH 10, 2% feather concentration, lactose as C and yeast extract as N sources, and 5% inoculum. Keratinase activity was performed using keratin azure as substrate. Details of the experimental findings will be presented in the paper.

Keywords: Keratinolytic proteases, serine, metalloproteases, *Streptomyces diastaticus* strain TS1-48, azocasein, keratin azure