EXPRESSION AND CHARACTERIZATION OF KERATINASE FROM *Deinococcus gobiensis* I-0

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Keratin is a nonnutritious hard protein widely distributed in feather, wool, animal hoof, horn, and toenail. The disulfide bond interacts to form a dense structure of keratin, which is difficult to be degraded and utilized. Keratinase is a kind of enzymes that can destroy the dense structure of keratin to achieve the degradation, and has a good application prospect. In order to further tap the important gene resources of keratinase, improve its hydrolytic activity，and provide theoretical basis for industrial production, this experiment cloned a gene encoding keratinase from *Deinococcus gobiensis* I-0 isolated from Gobi desert of Xinjiang and named it as Kerdg. Prokaryotic expression vector pET-22B-Kerdg was constructed and then induced, expressed and purified in vitro, the optimal temperature and pH of the crude enzyme solution were determined through the hydrolysis activity to feathers. Results showed that the first 50 amino acids of N terminal had a great influence on the expression and purification of protein Kerdg. The crude enzyme solution of recombinant strain completely decomposed feathers in three days. The transparent circle on milk powder plate appeared more notable in crude enzyme solution of recombinant strain than that of empty strain. Kerdg adapted to a wide range of temperatures and pH，among which the optimal temperature was 60℃ and the optimal pH was 5.0. The Kerdg can degrade feathers and thus will have great application space in the future industrial production and treatment of waste feathers.

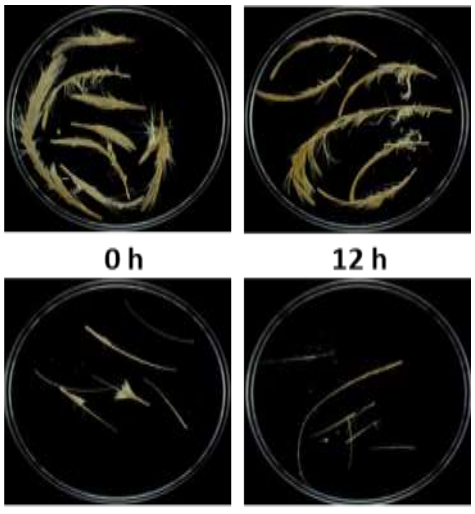

Figure1 Degradation of intact chicken feathers by Kerdg

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To examine its keratinolytic ability, Kerdg expression strain was cultured at 37 °C in medium with insoluble chicken feathers as the only source of nutrients. After two days of culture, the feather degradation indicated that Kerdg expression strain produced an extracellular keratinase to degrade feather keratin as a nutrient source. These properties made Kerdg an ideal candidate for keratinase purification and identification.