

ABSTRACT

In the present study, *Saccharomyces cerevisiae* was selected for biodegradation of chicken feathers under submerged fermentation conditions. Various culture conditions were optimized for maximum biodegradation and production of keratinase enzyme. Maximum biodegradation and production of keratinase was achieved at 2g/100ml of chicken feathers (1.151 ± 0.006 U/ml), 10g/100ml concentration of sucrose (1.699 ± 0.006 U/ml), 5g/100ml concentration of yeast extract (2.301 ± 0.004 U/ml), 2.5g/100ml concentration of KH_2PO_4 (0.517 ± 0.009 U/ml), 0.01g/100ml concentration of ZnSO_4 (0.637 ± 0.007 U/ml), $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ (4.551 ± 0.065 U/ml) and MgSO_4 (1.254 ± 0.007 U/ml), 0.25g/100ml concentration of CaCl_2 (0.882 ± 0.006 U/ml), pH 7.0 (1.685 ± 0.006 U/ml), 30°C incubation temperature (1.424 ± 0.006 U/ml), 1ml inoculum size (0.603 ± 0.005 U/ml), 15 days incubation time (1.837 ± 0.003 U/ml) and 50 ml fermentation volume (1.451 ± 0.007 U/ml). Maximum keratinase production (4.634 ± 0.021 U/ml) and biodegradation of chicken feathers was observed at optimized culture conditions. This study proved that *S. cerevisiae* is a significant fungal strain to reduce poultry keratinous waste and for the production of industrial keratinase enzyme.