ABSTRACT

The present study deals with biodegradation of chicken feathers and production of keratinase enzyme. For this purpose, various fermentation parameters were carried out in which different concentrations of substrate, KH_2PO_4, pH, $FeSO_4$, $MgSO_4$, $ZnSO_4$ and $CaCl_2$ were involved under submerged surface culture fermentation technique. Fungal strain of *Fusarium oxysporum* was used in this study which has capability to grow on keratinous material and was able to degrade chicken feathers by producing keratinase. Highest initial keratinase activity was 1.414 ± 0.002U/mlwhile lowest was 0.863 ± 0.002U /ml. The pH was maintained at 6.0 and temperature was 27ºC. Maximum keratinase activity was obtained with 1g chicken feathers concentration while minimum was obtained with 3g chicken feathers concentration i.e.0.953±0.002U/mland 0.613±0.0015U/ml. Keratinase activity was different with different concentrations of salts at an optimum pH of 6.0 and at a temperature of 27°C.The different activities of keratinase and highest biodegradation of chicken feathers by *Fusarium oxysporum* showed it as an efficient fungus for production of keratinase and useful in biotechnological processes for keratinase extraction and production. In final optimized fermentation media, keratinase production was 1.952 ± 0.002 and it was found to be higher than other fermentation media. The applied keratinase was found to be useful for healthy growth of corn stem, leaves and roots as compared to control grade in which only distilled water was used. Keratinase was also found to be useful in bioremediation in making the polluted water clean as COD values were reduced. Various tests such as pH, total dissolved solids (TDS) and electrical conductivity (EC) were also examined.