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Production and optimization of acid and neutral proteolytic enzymes by yeast strains isolated from soil of Saudi Arabia

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Protease enzymes have been found to be very important for the industry due to their applications in the different fields. In this study, 23 yeast isolates showed protease activity using casein hydrolysis test. Out of the 23 proteolytic yeast isolates, 5 isolates (21.74%) designated as KKU-M 12c, KKU-M 13c, KKU-M 18c, KKU-M 19c and KKU-M20c were identified as protease producers by exhibited high zones of clearance around the colonies. The selected five yeast isolates were identified by sequencing D1/D2 of 26S rDNA region and phylogenetic analysis as KKU-M12c *Rhodotorula mucilaginosa*, KKU-M13 *Cryptococcus albidus*, KKU-M18 *Pichia membranifaciens*, KKU-M19c *Hanseniaspora uvarum* and KKU- M20c *Candida californica*. To detect the optimum pH for the yeast extracellular proteases production, the influence of varying pH ranges (4.0-9.0) on the yield and activity of the proteases enzymes was investigated with 0.5% (w/v) casein as substrate. The enzyme activity was measured using qualitative and quantitative assays. Results showed that all the yeast under study secreted protease enzyme at varied levels of pH except pH 9.0 indicating that the five studied yeasts are not alkaline protease producers. The maximum activity of protease (187 U/ml) was observed by strain *H. uvarum* KKU-M19 at only pH 6.0. The result indicated that this yeast (KKU-M19) produced only neutral protease enzyme. The results of pH studies also showed that the other four yeast isolates *R. mucilaginosa* KKU-M12, *C. albidus* KKU-M13, *P. membranifaciens* KKU-M18 and *C. californica* KKU-M20 were produced both acidic (at pH 4.0) and neutral (at pH 6.0 and 7.0) protease enzymes. The *C. californica* strain KKU-M20 were found to be the best acidic and neutral protease producer (138 U/ml at pH4 and 185 U/ml at pH7 respectively).

Biography

Sulaiman A Alrumman has completed his PhD in 2011 from Aberdeen University, United Kingdom and his MSc in 2004 from King Abdul-Aziz University, Saudi Arabia. He is now the Dean of Science College, King Khalid University, Saudi Arabia. He has published more than 15 papers in his field (Microbiology and Biotechnology).

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