Extraction and Purification of L-Asparaginase Produced by Acinetobacter Baumannii and Their Antibiofilm Activity against Some Pathogenic Bacteria

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Abstract

L-asparaginase is an enzyme catalyzing the hydrolysis of L-asparagine and formation of L-aspartate and ammonia and widely used as anticancer drug in pharmaceutical and food industry. Eight Acinetobacter baumannii isolates of were isolated from different blood and sputum samples and screened for higher L-asparaginase production, Acinetobacter baumannii Sp3 gave higher asparaginase activity of 7.32 U/ml. L-asparaginase was purified to homogeneity with ammonium sulfate at 45% saturation followed by DEAE-Cellulose ion exchange chromatography and sephadex G-100 gel filtration chromatography with a recovery yield of 68% and 22.65 fold of purification. L-asparaginase had antibiofilm activity against all tested pathogenic bacteria after using Congo Red agar and Microtitration plates methods. Highly antibiofilm of L-asparaginase recorded against Klebsiella pneumoniae followed by Pseudomonas aeruginosa with reduction of biofilm formation ratio to 32 and 41% ,respectively compared with (100)% of control. Thus L-asparaginase has promising benefit as antibiofilm agent against biofilm forming pathogenic bacteria.

Keywords: Purification, Acinetobacter Baumannii, Antibiofilm Activity, Pathogenic Bacteria