Abstract

The present study investigates the purification and biochemical characterization of an extracellular lipase (HML) from Haloarchaea *Haloferax mediterranei* strain ATS1, isolated from the Sebkha (Medea, Algeria). The pure protein was obtained with ammonium sulfateprecipitation (40–70%)-dialysis and UNO Q-6 FPLC, and characterized biochemically. Matrix assisted laser desorption ionization-time of flight mass spectrometry (MALDI-TOF/MS) analysis revealed that the purified enzyme was a monomer, with a molecular mass of 45,011.09 Da. It showed optimum lipase activity at pH 7 and 60 °C. HML showed a higher specific activity on triacylglycerols with long-chains fatty acids, indicating that HML is a true lipase. This enzyme was completely inhibited by phenylmethanesulfonyl fluoride (PMSF) and diiodopropyl fluorophosphates (DFP), which suggested its belonging to the serine lipase family. The K_m and V_{max} for HML toward olive oil were 1.01 mM and 1195 U/mg, respectively. Compared to Lipolase, HML displayed an elevated organic solvent tolerance, an outstanding stability to surfactants, oxidizing, and auxiliary agents, a considerable compatibility with various commercialized laundry detergents, and wash performance analysis revealed that it could remove oil-stains effectively. Overall, HML has a number of attractive properties that make it a potential promising candidate for the synthesis of non-aqueous peptides and detergent formulations.