

Several bacterial species are known to be chitinase enzyme producers thereby degrading environmentally present chitin into valuable products. These chitinolytic bacteria eventually enable the organisms to access the carbon and nitrogen stored in chitin. Bacterial chitinases have been considered valuable in various sectors for instance; agriculture, environmental, biotechnological, and medicine. This current study was focused on isolating chitinolytic bacterial strains present in various samples of soil collected from different localities of Lahore, Pakistan. A total of 50 bacterial isolates were procured followed by screening. Outcomes of screening depicted that out of 50 isolates, 35 were observed to be active producers of chitinase enzyme. Among all bacterial isolates, MMF-45 displayed the highest chitinase enzyme activity. The 16S rDNA gene sequencing of MMF-45 revealed that this bacterium has 98.57% similarity with *Psychrobacter faecalis*. The chitinolytic enzyme produced by MMF-45 was optimized using various fermentation factors. Maximum yield of chitinase enzyme was observed in 4ZB medium of 6.5 pH supplemented with 1.5% (w/v) colloidal chitin, inoculated with 1.5% (v/v) inoculum size when incubated at 35 °C and 150 rpm for 72 hours. Furthermore, the addition of 1% (w/v) malt extract as an organic N source and 1% (w/v) starch as a C source increased chitinase activity up to 1.336-fold. The chitin-degrading ability of the chitinase enzyme was valuable in bioremediation, assisting in the waste material degradation having chitin. The produced chitinase can be utilized in various industrial sectors like food industries and most importantly as biocontrol agents.