Optimization of Laccase production by locally isolated Trichoderma muroiana IS1037 using rubber wood dust as substrate

ABSTRACT

Laccases have great biotechnological potential in various industries as they catalyze the oxidation of a broad variety of chemical compounds, diamines, and aromatic amines. The production of laccases by fungi has been broadly studied due to their secretion of enzymes and their growth using cheap substrates. In this study, five native fungi isolates (Dr1, Dr2, Dr4, K5, and K9) were screened for laccase enzyme production. The ability to produce laccase was evaluated based on light green to dark color formation on a potato dextrose agar using 2,2'-azinobis(3-ethylbenzthiazoline-6-sulfonic acid) as an indicator. The highest laccase production was obtained by Dr4, which was identified as Trichoderma muroiana IS1037. Among the different carbon sources tested (rubber wood dust, rice straw, sugar cane bagasse, and oil palm empty fruit bunch), the highest laccase activity (5.84 U/mL) was obtained in submerged fermentation using rubber wood dust as substrate. Laccase production was further enhanced with the addition of 2 mM copper sulfate. In conclusion, the local fungus isolate Trichoderma muroiana IS1037 is a potential fungi-producing laccase that can use rubberwood dust as carbon source.

Keyword: Laccase; Trichoderma muroiana; Rubberwood dust; Submerged fermentation; Biobleaching