

Optimization of an Ultrasound-Assisted Extraction Method for Phenolic Content in *Momordica Charantia* Seeds and Its Antifungal Activity Against *Pleurotus Ostreatus* Green Mold Pathogen

Abstract

Phenolic compounds from fruits and plant parts showed several biological properties such as antifungal activity. This study reports the optimized conditions for total phenolic content (TPC) extraction from *Momordica charantia* seeds using ultrasound-assisted extraction and its antifungal activity against *Pleurotus pulmonarius* green mold (GM) pathogens. Using water as solvent, a response surface methodology (RSM) was employed involving three independent factors including liquid to solid ratio (LSR) (10:1–60:1), pH (3.0–9.0), and extraction time (2–8 min). ANOVA suggested only parameters of pH and LSR were significant to produce TPC yield of 166.7 mg GAE/g, at optimized conditions of pH 9.0 and LSR 10:1. The antifungal activity of optimized *Momordica* seed extract (MSE) was tested against *P. pulmonarius* GM pathogens; *Trichoderma* sp., *Aspergillus flavus* and *Penicillium citrinum*. MSE presented antifungal activities against all tested strains, in a dose and strain-dependent manner. The highest growth inhibition was achieved when using 2.5 ml of extract for both *Trichoderma* sp. and *P. citrinum* with 63.1% and 89.2% inhibition, respectively. Meanwhile, 3.5 ml of extract was needed to achieve 79% inhibition on *A. flavus*. Conclusively, the use of non-toxic green solvent such as water, assisted with ultrasound power, is useful to produce MSE with antifungal activities as an alternative approach to chemical fungicides for the protection of grey oyster mushroom from GM pathogen.

Keywords

Antifungal agent; Green mold diseases; Grey oyster mushroom; *Momordica* seed extract; Ultrasound assisted extraction