

## Phenolic compounds and antimicrobial activity of edible mushrooms extracts against multidrug resistant *Pseudomonas aeruginosa*

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*Pseudomonas aeruginosa* is a leading cause of nosocomial infections and is responsible for 10% of all hospital-acquired infections belonging to the *critical* and *high* WHO global priority list of antibiotic-resistant bacteria. Infections caused by *P. aeruginosa* are often severe and life threatening since there is a high frequency of antibiotic resistance resulting in severe adverse outcomes [1]. Consequently, there is an urgent need for new drugs effective against *P. aeruginosa* infections. One promising strategy is to test the potential antimicrobial effect of natural resources such mushrooms which contain a significant amount of bioactive compounds, including phenolic compounds [2]. Hence, the present study aimed to evaluate, by diffusion disk method, *Pleurotus citrinopileatus*, *Pleurotus ostreatus* and *Agaricus bisporus* methanolic and aqueous extracts in inhibiting the multidrug resistant *P. aeruginosa* isolated from clinical wound infections. The phytochemical composition and antioxidant activity of these extracts were also determined. The results noticed a positive correlation between phenolic compounds content, antioxidant activity, and antimicrobial capacity of the mushroom's extracts. The *Pleurotus citrinopileatus* aqueous extracts, which contained the highest amount of total phenolic compounds, exhibited the highest scavenging capacity of ABTS which, in turns, exhibited the highest antimicrobial efficacy in inhibiting the growth of multidrug resistant *Pseudomonas aeruginosa*. These data suggest that *Pleurotus citrinopileatus* aqueous extract may represent a valuable therapeutic source of compounds to be used against multi-resistant bacteria.

### References

1. Hirsch, E.B. and V.H. Tam, Impact of multidrug-resistant *Pseudomonas aeruginosa* infection on patient outcomes. Expert review of pharmacoeconomics & outcomes research, 2010. 10(4): p. 441-451.
2. Alves, M.J., et al., A review on antimicrobial activity of mushroom (Basidiomycetes) extracts and isolated compounds. Planta Med, 2012. 78(16): p. 1707-18.

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