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NOTE

Antibacterial Activity of Methanolic Exract of Basidiomycetes

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The antibacterial properties of *Lentinus* sp., *Pleurotus aureovillosus* and *Schizophyllum commune* were investigated against bacterial strains namely *Pseudomonas aeruginosa, Salmonella abony, Bacillus cereus* and *Staphylococcus aureus*. The methanolic extracts of these three mushrooms showed better antibacterial activity against *S. aureus* and *B. cereus*. In contrast, the antibacterial activity of *P. aureovillosus* was reported to be positive for the both Gram positive and Gram negative bacteria.

Key Words: Basidiomycetes, Methanolic extract, Antibacterial activity, Well diffusion method.

Mushrooms have long been used as food and also in folk medicine for centuries. In Kampo Chinese folk medicine, mushrooms have been known to have medicinal properties since 1200 AD[1]. They have been found to boost the immune system, anticancerous properties, antihypercholesterolaemic, hepto-protective agents, anti-HIV activity, antiviral activity and ameliorate the toxic effect of chemo and radio therapy[2-4]. In the present study, antibacterial activity of *Lentinus* sp., *P. aureovillosus, S. commune* mushrooms were tested against *P. aeruginosa, S. abony, B. cereus, S. aureus*.

These three basidiomycetes were grown under submerged conditions using potato dextrose broth. Mycelium were harvested on 15th day, removed the residual and dried at 45-50 °C. Methanol was used to extract the bioactive components of the mushroom samples. Assay of the antibacterial activity of the medicinal mushroom extract was done by well diffusion method using nutrient agar medium[5].

In this technique, a loopful of bacteria were taken from the active culture and dissolved in 1 mL of saline. The suspension was added to the prepared nutrient agar medium and poured into the periplate. The wells were made by using cork borer. The wells were filled with 100 µL of methanolic extracts of mushroom and the plates were incubated at 37 °C for 18 h. The zone of clearance was observed and recorded.

The methanolic mushroom extracts displayed higher antibacterial activity against Gram positive organisms such as *S. aureus* and *B. cereus*. In that, *Lentinus* sp. showed better antibacterial activity against *S. aureus* (16 mm) and *B. cereus* (17 mm) followed by the antibacterial activity of *P. aureovillosus* against *B. cereus* (13.5 mm) and *S. aureus* (8 mm). *S. commune* was showed zone of inhibition against *S. aureus* (9 mm) and *B. cereus* (9 mm).

In contrast, the antibacterial activity of *P. aureovillosus* was reported to be positive for both Gram positive and Gram negative bacteria, *S. abony* (6 mm) (Table- 1). There is no clearance zone were found against *P. aeruginosa*. This was accepted with earlier studies[6-8].

TABLE-1
ANTIMICROBIAL ACTIVITY OF THREE DIFFERENT BASIDIOMYCETES MYCELIAL EXTRACTS

Solvent extract of basidiomycetes	Organisms tested against the solvent extract			
	S. aureus	*P. aeroginosa*	*S. abony*	*B. cereus*
Lentinus sp.	+ (16)	–	–	+ (17.0)
Schizophyllum commune	+ (9)	–	–	+ (9.0)
Pleurotus aureovillosus	+ (8)	–	+ (6)	+ (13.5)

+ = Zone of inhibition (mm); – = No inhibition.

Thus, the results of the present study confirm the presences of antimicrobial activity in the medicinal mushroom sample. If these mushrooms are made a part of our daily diet, which not only provide nutrients but also protect body against infections by its antibacterial activity against pathogens. The active chemicals of extract which is responsible for antibacterial activity remains to be elucidated in further studies.

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