

Wild mushroom extracts in the fight against canine pyoderma

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Introduction

Staphylococcus pseudintermedius is one of the most common pathogens causing skin disorders in pets, particularly, canine pyoderma. *S. pseudintermedius* can be distinguished by its resistance to methicillin, being MSSP (methicillin-susceptible *S. pseudintermedius*) or MRSP (methicillin-resistant *S. pseudintermedius*). The identification of MRSP and its propensity for multidrug resistance has led to the need of veterinarians to seek best practices in the treatment of canine pyoderma. Mushrooms have medicinal properties since they are a rich source of phenolic acids with high bioactive potential and which have proven to have several biological benefits, namely, in antioxidant and antimicrobial activities. Therefore, we aimed to extract phenolic compounds from two species of wild mushrooms and evaluate their antimicrobial activity against 10 MSSP and MRSP isolated from canine pyoderma.

Methods

Three hundred grams of two species of mushrooms, *Gymnopilus junonius* (inedible) and *Lactarius deliciosus* (edible), were freeze-dried, mill-powdered and stored in a desiccator. After the extraction of phenolic acids, the phenolic profile of the extracts was performed by HPLC-DAD-MS. The evaluation of the antioxidant properties was performed using 3 methods. Finally, the antimicrobial susceptibility assay was performed using the Kirby-Bauer disk diffusion method.



Gymnopilus junonius

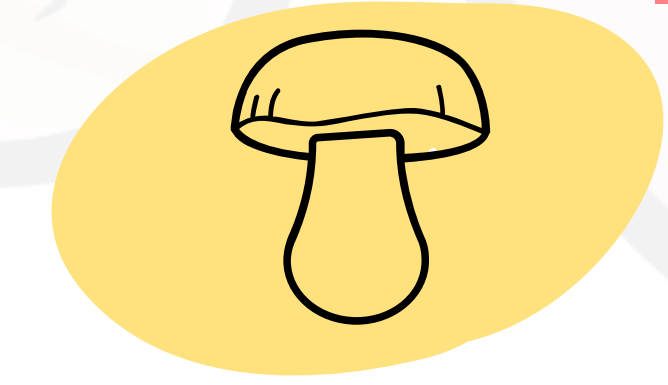



Lactarius deliciosus

Results and Discussion

The results are shown in Table 1. *Gymnopilus junonius* and *Lactarius deliciosus* had a higher content of gallic acid and p-hydroxybenzoic acid, respectively. *Gymnopilus junonius* obtained better antioxidant activity than *Lactarius deliciosus* extracts with values of 69%, 76% and 50% in FRAP, β -carotene and lipid peroxidation assays, respectively. *Gymnopilus junonius* showed inhibition of bacterial growth in all isolates except 2 isolates with halos up to 13 mm in diameter. *Lactarius deliciosus* inhibited the growth of all strains, except for one, with halos up to 14 mm.

Table 1. Antimicrobial, antioxidant activities and chemical composition of *Gymnopilus junonius* and *Lactarius deliciosus* mushrooms.

	Number of inhibited bacteria	Antioxidant activity (% of inhibition)			Chemical composition (ug/g dw*)	Total content of phenolic acids (ug/g dw)
		FRAP	β -carotene	lipid peroxidation		
 <i>Gymnopilus junonius</i>	8/10	69.1%	75.7%	49.7%	Gallic acid (8.6) Protocatechuic acid (2.05) p-hydroxybenzoic acid (7.9)	18.5 \pm 0.2
 <i>Lactarius deliciosus</i>	9/10	64.6%	60.2%	29%	Gallic acid (15.1) Protocatechuic acid (5.8) p-hydroxybenzoic acid (55.9) p-coumaric acid (16.92) Cinnamic acid (5.4)	94 \pm 2

*Micrograms of phenolics by gram of dry weight.

Conclusions

In conclusion, it appears that mushrooms are a rich source of phenolic compounds with promising antioxidant and antimicrobial activities. However, *in vivo* studies should be carried out with mushroom extracts being applied directly in canine pyoderma.



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