

Comparison of the SOD and DPPH activity, L-amino acid Contents on Edible Mushrooms and Medicinal mushrooms

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Objectives

The main purpose of this experiment was to evaluate the comparison of the SOD and DPPH activity, L-amino acid contents between edible mushrooms and medicinal mushrooms.

Materials and Methods

- Mushroom cultivar : Pleurotus ostreatus, Agaricus bisporus, Flammulina velutipes, Pleurotus eryngii, Lentinus edodes, Agaricus blazei, Sparassis crispa, Unpolished Rice - Phellinus Linteus, Ganoderma lucidum, Inonotus Obliquus
- Extract of enzyme for SOD : PD-10 Sephadex G-25 column
Detecting: SOD(560nm) by UN-VIS spectrophotometer
- Extract of substrate for DPPH : mushrooms(5g) in 80% MeOH(100ml) for 24 hr
Detecting: DPPH(517nm) by UN-VIS spectrophotometer
Inhibitory effect(%) = (1- Sample/Control) x 100
- Analysis of L-Amino acid by HPLC
 - Column : Sodium Cation exchange Na⁺ 8 μm (3.0 x 250mm)
Guard column : Sodium Guard column Na⁺ 8 μm (2.0 x 20mm)
 - Solvent A : Sodium eluant Na 328
Solvent B : Sodium eluant Na 740
Solvent C : Sodium Regenerant RG 011
Ninhydrin reagent : derivative reagent
Wave length : 570 nm

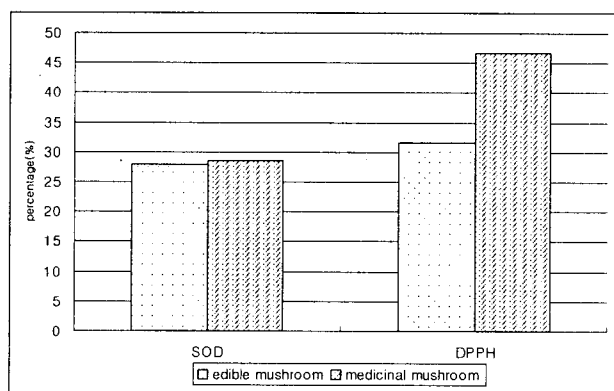
Results and Discussion

- DPPH activity represented from 15 % to 70 % on 10 mushroom varieties, and Ganoderma lucidum exhibited the highest activity (69.9%), while Pleurotus eryngii (14.9%) appeared the lowest. Also medicinal mushrooms(46.6%) were showed higher DPPH activity than edible mushrooms(31.50%).
- Sparassis crispa obtained highest activity (49.9%) in SOD. In contrast, Ganoderma lucidum that was represented highest in DPPH was showed lowest (8.1%) in SOD.
- The average concentration of total L-amino acid in 10 mushrooms was 152297.9 μg·g⁻¹ in edible mushrooms was 181362.3 μg·g⁻¹, medicinal mushrooms was 123233.4 μg·g⁻¹.
- Tryptophan could not detect in both edible mushrooms and medicinal mushrooms

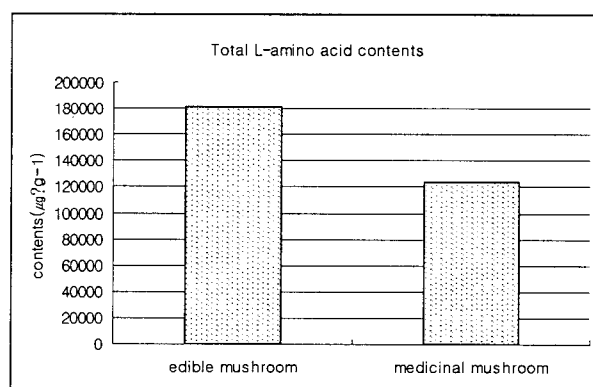
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Table 1. the SOD, DPPH activity of edible mushrooms and medicinal mushrooms

	Pleurotus ostreatus	Agaricus bisporus	Flammulina velutipes	Pleurotus eryngii	Lentinus edodes	Agaricus blazei	Sparassis crispa	Unpolished Rice - Phellinus Linteus	Ganoderma lucidum	Inonotus Obliquus
	----- Inhibition (%) -----									
DPPH	44.3	61.2	17.2	14.9	19.9	53.6	37.2	28.5	69.9	44.0
SOD	18.0	47.6	40.6	25.4	48.7	47.7	49.9	24.4	8.1	12.8



A



B

Fig 1. Compare edible mushroom with medicinal mushroom by SOD, DPPH activity(A) and total L-amino acid(B)

Table 2. 17 L-Amino acid concentration ($\mu\text{g}\cdot\text{g}^{-1}$) according to the edible mushrooms and medicinal mushrooms

Variety	Thr ¹⁾	Glu ²⁾	Asn ³⁾	Pro ⁴⁾	Gly ⁵⁾	Ala ⁶⁾	Cys ⁷⁾	Val ⁸⁾	Met ⁹⁾	Ile ¹⁰⁾	Leu ¹¹⁾	Tyr ¹²⁾	Phe ¹³⁾	Lys ¹⁴⁾	His ¹⁵⁾	Try ¹⁶⁾	Arg ¹⁷⁾	Tot ¹⁸⁾
Pleurotus ostreatus	5068.2	4625.0	3914.8	155069.6	369.3	2672.5	73647.9	43.4	826.5	2002.5	2691.3	1780.9	2763.1	5733.2	3926.5	0.0	2557.1	267739.6
Agaricus bisporus	5188.3	10357.7	0.0	135259.7	351.0	2549.1	68282.1	33.7	6702.8	1800.5	2667.2	1211.9	2161.6	6027.9	1586.3	0.0	1371.2	245596.1
Flammulina velutipes	1722.2	2288.3	2497.9	50359.5	152.3	675.5	25463.2	14.5	1629.7	849.6	1048.6	1355.7	1486.8	4644.7	661.0	0.0	426.7	95324.0
Pleurotus eryngii	4372.5	3328.6	3237.5	100676.3	279.5	1855.1	41183.7	22.5	720.0	1049.9	2091.0	1497.9	1247.2	4789.4	803.5	0.0	1575.1	168777.8
Lentinus edodes	3279.8	2229.9	2440.0	89933.8	189.6	932.7	20607.8	12.3	593.5	630.9	1283.7	1282.5	806.5	4133.0	426.4	0.0	543.6	129374.1
Agaricus blazei	4791.4	10323.3	0.0	172868.7	779.3	3010.6	78085.7	37.0	5958.2	2038.9	2844.0	963.6	2365.6	6381.8	76.4	0.0	4466.1	295035.7
Sparassis crispa	4736.0	4340.6	4505.4	119544.7	347.8	2446.8	57562.8	33.0	1729.6	1345.4	2692.1	1125.0	1691.7	4965.9	868.9	0.0	1284.0	209267.5
Unpolished Rice - Phellinus Linteus	2331.5	895.4	1126.5	72096.4	165.6	534.6	12035.9	7.2	13.5	269.6	765.5	88.3	356.7	2140.4	136.5	0.0	362.8	93374.2
Ganoderma lucidum	528.1	349.1	425.1	8736.9	73.1	169.1	3038.3	2.0	1065.0	49.5	134.8	1090.4	0.0	814.9	0.0	0.0	1.5	16509.6
Inonotus Obliquus	56.5	19.1	62.4	1272.3	23.3	34.0	433.6	0.0	20.5	0.0	11.1	0.0	0.0	53.6	0.0	0.0	22.0	1979.9

Thr¹⁾: Threonine, Glu²⁾: Glutamine, Asn³⁾: Asparagine, Pro⁴⁾: Proline, Gly⁵⁾: Glycine, Ala⁶⁾: Alanine, Cys⁷⁾: Cystine, Val⁸⁾: Valine, Met⁹⁾: Methionine, Ile¹⁰⁾: Isoleucine, Leu¹¹⁾: Leucine, Tyr¹²⁾: Tyrosine, Phe¹³⁾: phenylalanine, Lys¹⁴⁾: Lysine, His¹⁵⁾: Histidine, Try¹⁶⁾: Tryptophan, Arg¹⁷⁾: Arginine, Tot¹⁸⁾: Total