Chemical characterization and biological activities of some wild edible mushrooms

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INTRODUCTION

Over the last decade, the proven health-promoting abilities of different food classes, especially wild foods originated from unpolluted areas (i.e. mountains) gain the attention of consumers and food industry (Barros L. et al., 2008)

It is well known that, mushrooms are consumed as a delicacy for their texture and flavor and have an important nutritional value due to their high protein, essential amino acids and fibers content but a low fat content at the same time and proved to be effective mainly as antioxidants, anticancer and antimicrobial agents (Heleno S.A., et al., 2012).

EXPERIMENTAL DESIGN

Total Phenolic Content
Total Flavonoid Content
Antioxidant activity (ABTS)
} UV-VIS

Phenolic Content (HPLC–DAD)

Chemical composition

RESULTS

Table 1. Total phenolic content, flavonoids and antioxidant activity of selected mushrooms

Mushroom species	TP mg GAE/100 g DW)	TF (mg QE/100 g DW)	ABTS uM Trolox/g DW
A. bisporus	408.57±0.02^{c}	40.56±0.05^{b}	18.38±0.01^{c}
P. ostreatus	519.22±0.04^{b}	30.69±0.00^{c}	27.17±0.00^{b}
C. cibarius	104.91±0.03^{e}	20.53±0.03^{d}	12.50±0.00^{d}
B. edulis	**806.58±0.00^{a}**	**70.81±0.01^{a}**	**97.09±0.01^{a}**
L. piperatus	113.06±0.02^{d}	12.52±0.03^{e}	11.15±0.00^{e}

Table 2. Chemical composition of selected mushrooms

Samples	Moisture (g/100g)	Total fat (g/100g)	Crude protein (g/100g)	Ash (g/100g)	Carbohydrates (g/100g)	Energy (kcal)
A.bisporus	5.35±0.07	2.41±0.01	34.68±0.17	7.24±0.05	50.33±0.31	361.70±0.44
C. cibarius	2.17±0.02	2.17±0.04	21.03±0.04	9.57±0.08	65.06±0.11	363.9±0.66
B.edulis	7.23±0.18	1.92±0.09	36.24±0.12	8.38±0.07	46.23±0.22	347.5±0.52
L.piperatus	14.2±0.27	2.69±0.05	31.81±0.15	8.30±0.21	43.01±0.70	323.50±1.67
P.ostreatus	7.26±0.08	1.26±0.08	17.92±0.18	11.11±0.22	62.45±0.58	332.80±0.82

Tabel 3. The phenolic content in analyzed mushrooms extracts determined by HPLC–DAD and expressed as mg acid Gallic equivalents per 1000 gr FW

Peak no.	Compound	Phenolic compound in analyzed mushrooms extracts (mg/100g FW)				
		Pleurotus ostreatus	*Agaricus bisporus*	*Cantharellus cibarius*	*Boletus edulis*	*Lactarius piperatus*
1	4-Hydroxybenzoic acid	75.042±0.20	79.495±0.02	16.159±0.12	209.867±0.35	42.931±0.22
2	2,4-Dihydroxybenzoic acid	11.835±0.20	19.622±0.06	4.960±0.02	69.130±0.15	ND
3	4-Hydroxyphenylacetic acid	4.023±0.05	5.064±0.005	1.601±0.01	25.300±0.28	7.382±0.03
4	Protocatechuic acid	17.278±0.6	46.108±0.05	5.168±0.02	43.582±0.25	5.481±0.01
5	Catechin	14.856±0.10	31.290±0.02	2.434±0.06	145.566±0.40	6.471±0.05
6	Gallocatechin	5.038±0.15	5.273±0.01	1.028±0.02	26.628±0.25	10.950±0.2
7	p-Coumaric acid	ND	ND	1.470±0.01	23.112±0.20	5.194±0.06
8	Ferulic acid	ND	ND	ND	ND	9.153±0.03
9	Sinapic acid	ND	ND	ND	27.383±0.08	8.658±0.01
10	o-Coumaric acid	3.632±0.20	ND	ND	11.419±0.06	6.366±0.24
11	Cinnamic acid	10.091±0.15	14.362±0.02	2.382±0.01	168.614±0.45	14.544±0.15
12	3-Feruloylquinic acid	ND	ND	9.492±0.08	ND	66.734±0.40
13	4-Feruloylquinic acid	ND	60.458±0.06	6.314±0.06	ND	87.621±0.35
14	5-Feruloylquinic acid	35.040±0.08	71.005±0.04	55.327±0.25	ND	38.191±0.10
15	3,5 Dicaffeoylquinic acid	14.596±0.10	13.997±0.11	54.207±0.13	31.550±0.45	61.135±0.30

ND-not identified

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CONCLUSIONS

- It was established, that 4-hydroxybenzoic acid, cinnamic acid and 4-feruloylquinic acid are the major phenolic compounds in the analyzed mushrooms samples.
- as an overall conclusion it can be stated that due to their wide range of bioactives, the selected mushrooms may be further exploited as functional ingredients in the composition of innovative food products and not only.

REFERENCES

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