

## Volatile Components of Ten Frozen Mushrooms (Basidiomycetes)

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**ABSTRACT:** Twenty-nine volatile substances of ten frozen mushrooms (*Grifola frondosa*, *Clitocybe nebularis*, *Clitocybe odora*, *Tricholoma sulfureum*, *Agaricus bisporus*, *Amanita ovoidea*, *Clitopilus prunulus*, *Hebeloma radicosum*, *Pholiota apicrea*, *Boletus satanas*, Basidiomycetes) from France have been identified by GC/MS. The main components of the fruit bodies were 1-octen-3-ol, benzaldehyde, 2-phenylethanol, (E,E)-2,4-decadienal and (E,Z)-2,4-decadienal. Lysidine,  $\delta$ -cadinene, cis-sabinene hydrate and trans-sabinene hydrate were identified for the first time in mushrooms.

**KEY WORD INDEX:** Mushroom, *Grifola frondosa*, *Clitocybe nebularis*, *Clitocybe odora*, *Tricholoma sulfureum*, *Agaricus bisporus*, *Amanita ovoidea*, *Clitopilus prunulus*, *Hebeloma radicosum*, *Pholiota apicrea*, *Boletus satanas*, Basidiomycetes, 1-octen-3-ol, benzaldehyde, 2-phenylethanol, (E,E)-2,4-decadienal, (E,Z)-2,4-decadienal.

**MUSHROOM NAME (3):** *Grifola frondosa* (Dicks.: Fr.) S. F. Gray, *Clitocybe nebularis* (Batsch.: Fr.) Kumm., *Clitocybe odora* (Bull.: Fr.) Kumm., *Tricholoma sulfureum* (Bull.: Fr.) Kumm., *Agaricus bisporus* (Lange) Imbach, *Amanita ovoidea* (Bull.: Fr.) Link, *Clitopilus prunulus* (Scop.: Fr.) Quél., *Hebeloma radicosum* (Bull.: Fr.) Ricken, *Pholiota apicrea* (Fr.) Mos. ex Sing., *Boletus satanas* Lenz.

**SOURCE:** The fruit bodies of nine wild mushrooms were obtained between September

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Table I. Percentage\* of volatile compounds identified in frozen mushrooms

Compound	KI	Mushroom type									
		1	2	3	4	5	6	7	8	9	10
3-methylbutan-2-one	652	-	-	6	-	-	30	1	-	-	-
3-methylbutan-2-ol	663	-	-	-	-	-	2	-	-	-	-
heptene**	691	-	-	-	-	-	5	-	-	-	-
2-methylbutan-2-ol	697	-	-	40	-	-	-	-	-	-	-
3-methylbutanol	715	-	-	-	-	-	-	-	10	-	-
hexanal	775	-	-	-	-	20	-	-	4	-	14
isovaleric acid	880	-	-	-	-	-	-	-	-	-	22
benzaldehyde	935	-	7	-	8	8	3	6	12	40	10
1-octen-3-one	948	5	-	-	-	-	-	5	-	-	-
1-octen-3-ol	965	65	50	45	45	30	30	16	12	5	4
3-octanol	979	20	-	2	-	-	-	-	-	-	-
benzyl alcohol	1029	-	-	-	-	26	-	3	5	-	-
octanol	1050	-	-	-	-	-	5	-	-	-	-
cis-linalool oxide (furanoid)	1060	-	-	-	10	-	-	-	-	-	-
2-phenylethanol	1095	3	-	2	22	-	-	-	30	-	-
2-phenylpropanal	1110	-	-	-	-	-	-	1	-	-	-
cis-sabinene hydrate	1112	-	20	-	-	-	-	-	-	-	-
trans-sabinene hydrate	1133	-	10	-	-	-	-	-	-	-	-
4-methoxy- benzaldehyde	1265	-	-	-	-	-	-	-	-	-	20
methyl benzoate	1270	-	3	-	-	-	-	-	-	-	-
indole	1293	-	-	-	-	-	-	5	-	-	-
(E,Z)-2,4-decadienal	1317	-	3	-	-	5	-	-	-	-	5
2,3-dihydro-2- oxo-indole	1346	-	-	-	-	-	-	2	-	-	-
(E,E)-2,4-decadienal	1348	-	-	-	4	3	-	-	-	-	18
benzene acetamide	1360	-	-	-	3	-	-	50	20	-	-
lysidine	1370	-	-	-	-	-	-	-	-	-	2
4-hydroxy- benzaldehyde	1416	-	-	-	-	-	-	7	-	40	-
$\delta$ -cadinene	1515	-	-	-	-	-	5	-	-	-	-
methyl 2,4-dihydroxy- benzoate	1560	-	-	-	-	-	12	-	-	-	-

\* relative percentage of the identified volatile based on the GC/MS chromatographic area

\*\* correct isomer not identified

KI = Kovats indices

Mushroom type: 1 = *Pholiota apicrea*, 2 = *Amanita ovoidea*, 3 = *Boletus satanas*, 4 = *Clitocybe*

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