



Essential Oil University

GC/MS Report

Item	Lot
Black Pepper EO <i>Piper nigrum</i>	1C
Date	Analyst
7/11/2025	Dr. Robert S. Pappas

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The analysis of this batch sample, Black Pepper EO, meets the expected chemical profile for authentic essential oil of *Piper nigrum*. No contamination or adulteration was detected. The results provided in this GCMS quality analysis reflect the chemical composition of the oil and lot referenced above on the date of analysis.



Sample Information

Company: Revive
Sample Name: Black Pepper EO
Botanical Name: Piper nigrum
Lot Number: 1C
Production Method: Steam distilled

Sample Type: EO - Single
Country of Origin: India
Analysis Date: 7/11/2025
Manufacture Date: March 2025

GC/MS

Inst. ID: Shimadzu GCMS-QP2010Ultra
Injection Type: Split
Split Ratio: 24.4

Column Type: ZB-5
Injection Volume: 0.1 µL
Temperature Program: 2C/min

Physical Data

ANALYSIS

Optical Rotation @20°C
Refractive Index @20°C
Specific Gravity @20°C

METHOD

USP[781]
USP[831]
USP[841]

RESULTS

-10.96
1.48165
0.87367



Ret. Time	Component	Ret. Idx.	Conc. %	
11.501	Tricyclene	921	0.01%	
11.649	alpha-Thujene	924	0.87%	
12.061	alpha-Pinene	931	10.22%	
12.843	alpha-Fenchene	946	0.01%	
12.935	Camphene	947	0.24%	
14.198	Sabinene	971	9.11%	
14.499	beta-Pinene	976	9.35%	
14.794	Camphene isomer	982	0.01%	
14.977	para-Menth-3-ene	985	0.01%	
15.110	Myrcene	987	2.09%	
15.719	delta-2-Carene	999	0.01%	
16.011	Pseudolimonene	1003	0.06%	
16.159	alpha-Phellandrene	1006	1.16%	
16.318	delta-3-Carene	1008	10.44%	
16.667	1,4-Cineole	1013	0.01%	
16.807	alpha-Terpinene	1016	0.17%	
16.966	ortho-Cymene	1018	0.02%	
17.289	para-Cymene	1023	0.45%	
17.613	Limonene	1028	14.8%	IFRA
17.700	beta-Phellandrene	1029	1.01%	
17.760	1,8-Cineole	1030	0.04%	
17.983	cis-beta-Ocimene	1034	0.02%	
18.655	trans-beta-Ocimene	1044	0.12%	
19.095	gamma-Terpinene analogue	1051	0.02%	
19.430	gamma-Terpinene	1056	0.18%	
20.202	trans-Sabinene hydrate	1068	0.09%	
20.958	Isoterpinolene	1080	0.1%	
21.218	Terpinolene	1084	0.51%	
21.543	para-Cymenene	1089	0.01%	
22.165	Linalool	1098	0.35%	IFRA
22.240	cis-Sabinene hydrate	1099	0.05%	
22.815	Unidentified	1108	0.01%	
23.657	trans-para-Mentha-2,8-dienol	1120	0.01%	
23.847	cis-para-Menth-2-en-1-ol	1123	0.01%	
24.951	trans-Pinocarveol	1139	0.02%	
25.077	trans-para-Menth-2-en-1-ol	1141	0.02%	
26.452	para-Mentha-1,5-dien-8-ol	1161	0.02%	
27.329	Unidentified	1173	0.01%	
27.697	Terpinen-4-ol	1179	0.23%	
28.129	para-Cymen-8-ol	1185	0.02%	



Ret. Time	Component	Ret. Idx.	Conc. %	
28.246	Unidentified	1187	0.01%	
28.705	alpha-Terpineol	1193	0.07%	
29.245	alpha-Phellandrene epoxide	1201	0.02%	
37.091	Unidentified	1317	0.03%	
37.894	Elemene isomer	1330	0.08%	
38.130	delta-Elemene	1333	1.88%	
38.899	alpha-Cubebene	1345	0.18%	
40.283	Cyclosativene	1366	0.1%	
40.775	alpha-Copaene	1374	2.99%	
41.557	beta-Cubebene	1386	0.27%	
41.663	beta-Elemene	1387	0.33%	
41.893	Unidentified	1391	0.01%	
42.616	cis-beta-Caryophyllene	1402	0.03%	
42.781	alpha-Gurjunene	1404	0.06%	
43.626	beta-Caryophyllene	1418	26.07%	
44.080	Unidentified	1425	0.02%	
44.209	beta-Copaene	1427	0.13%	
44.553	alpha-Guaiene	1433	0.04%	
45.400	Cadina-3,5-diene	1446	0.06%	
45.671	trans-beta-Farnesene	1451	0.06%	
45.802	alpha-Humulene	1453	0.96%	
46.078	Alloaromodendrene	1457	0.02%	
46.522	Unidentified	1464	0.03%	
46.841	Cadina-1(6),4-diene	1470	0.04%	
47.022	gamma-Murolene	1472	0.06%	
47.129	Unidentified	1474	0.03%	
47.390	Germacrene D	1478	0.26%	
47.879	beta-Selinene	1486	0.18%	
48.036	gamma-Amorphene	1489	0.08%	
48.285	Bicyclogermacrene	1493	0.46%	
48.480	alpha-Murolene	1496	0.4%	
48.848	trans,trans-alpha-Farnesene	1502	0.02%	
49.056	beta-Bisabolene	1505	0.72%	
49.475	Cubebol	1512	0.18%	
49.663	delta-Cadinene	1516	1.02%	
49.859	trans-Calamenene	1519	0.05%	
50.509	trans-Cadine-1,4-diene	1530	0.05%	
51.009	trans-alpha-Bisabolene	1538	0.03%	
51.595	Unidentified	1548	0.03%	
52.044	Germacrene B	1556	0.01%	



Ret. Time	Component	Ret. Idx.	Conc. %	
52.205	trans-Nerolidol	1559	0.06%	
53.100	Spathulenol	1574	0.05%	
53.402	Caryophyllene oxide	1579	0.54%	
56.070	Unidentified	1625	0.16%	
56.972	epi-alpha-Murolol	1641	0.05%	
57.121	delta-Cadinol	1644	0.2%	

Total Identified Compounds **99.68 %**

