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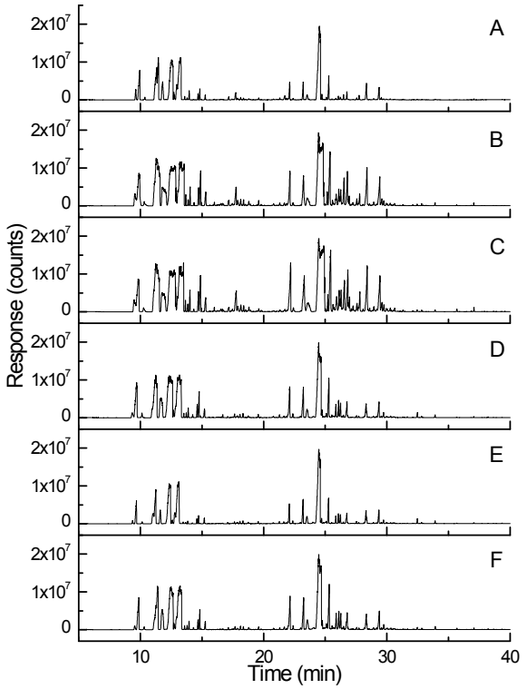

Fig. S1 Total ions chromatograms of EOs obtained with different extraction methods. (A: white pepper powder treated by HD; B: white pepper powder treated by MHD; C: white pepper powder treated by DES-MHD; D: black pepper powder treated by HD; E: black pepper powder treated by MHD; F: black pepper powder treated by DES-MHD. The conditions applied for DES-MHD were the optimized ones.)

Table S1 Identification basis for EO components from white and black peppers.

No.	Compound name	CAS#	Formula	MW	RI[a]	RI[b]	Peaks[c] (Abundance‰)	Peaks[d] (Abundance‰)	ID approach
1	3-Thujene	2867-05-2	$C_{10}H_{16}$	136	927	923	91, 93, 92 (999, 832,584)	93, 91, 77 (999, 349,342)	RI, MS
2	1S-α-Pinene	7785-26-4	$C_{10}H_{16}$	136	935	937	93, 91, 92 (999, 952,550)	93, 39, 91 (999, 619,596)	RI, MS
3	Tricyclene	508-32-7	$C_{10}H_{16}$	136	937	934	93, 92, 136 (999, 818,458)	93, 91, 92 (999, 314,270)	RI, MS
4	α-Phellandrene	99-83-2	$C_{10}H_{16}$	136	978	971	93, 91, 77 (999, 874,486)	93, 91, 77 (999, 319,307)	RI, MS
5	Sabinene	3387-41-5	$C_{10}H_{16}$	136	982	986	93, 91, 77 (999, 692,440)	93, 41, 91 (999, 376,355)	RI, MS
6	β-Pinene	127-91-3	$C_{10}H_{16}$	136	988	990	93, 91,69 (999, 671, 410)	93, 41,69 (999, 609, 350)	RI, MS
7	Camphene	79-92-5	$C_{10}H_{16}$	136	991	995	93, 91, 69 (999, 676,318)	93, 121,79 (999, 582,399)	RI, MS

8	2-Isopropyltoluene	527-84-4	$C_{10}H_{14}$	134	1028	1028.4	119, 134,91 (999, 711,569)	119, 91,134 (999, 393,256)	RI, MS
9	Eucalyptol	470-82-6	$C_{10}H_{18}O$	154	1038	1044	111, 81,43 (999, 368,347)	43, 81, 71 (999, 595,435)	RI, MS
10	5-Isopropyl-2-methylbicyclo[3.1.0]hexan-2-ol	15537-55-0	$C_{10}H_{18}O$	154	1046	1041[c]	111, 93, 81 (999, 500, 348)	43, 93, 71 (999, 940, 798)	RI, MS
11	cis-Ocimene	3338-55-4	$C_{10}H_{16}$	136	1052	1046	93, 91, 79 (999, 926,537)	93, 91, 79 (999, 491,441)	RI, MS
12	τ-Terpinen	99-85-4	$C_{10}H_{16}$	136	1060	1062	93, 91, 77 (999, 947,487)	93, 91, 77 (999, 565,415)	RI, MS
13	4-Isopropyl-1-methyl-2-cyclohexen-1-ol	29803-82-5	$C_{10}H_{18}O$	154	1072	1074	99, 43, 71 (999, 926,623)	43, 93, 139 (999, 448,385)	RI, MS
14	α- Terpinolen	586-62-9	$C_{10}H_{16}$	136	1082	1085	93, 91, 136 (999, 861,719)	93, 121,91 (999, 783,617)	RI, MS
15	4-Isopropenyltoluene	1195-32-0	$C_{10}H_{12}$	132	1090	1089	117, 132,91 (999, 986,699)	117, 132,115 (999, 807,634)	RI, MS
16	β-Linalool	78-70-6	$C_{10}H_{18}O$	154	1098	1100	93, 71, 43 (999, 837,820)	71, 93, 41 (999, 609,569)	RI, MS
17	Pinane, 2,10-epoxy-	6931-54-0	$C_{10}H_{16}O$	152	1100	1109	43, 67, 79 (999, 852,689)	79, 41, 71 (999, 939,922)	RI, MS
18	4-Isopropyl-1-methyl-2-cyclohexen-1-ol	29803-81-4	$C_{10}H_{18}O$	154	1124	1120	43, 79, 137 (999, 997,915)	43, 93, 139 (999, 460,354)	RI, MS
19	Cis-Ocimene, 8-oxo-	N/A	$C_{10}H_{14}O$	150	1164	1164[c]	94, 79, 91 (999, 973,710)	107, 79,41 (999, 894,689)	RI, MS
20	2-Pinen-4-ol	473-67-6	$C_{10}H_{16}O$	152	1173	1165	91, 95, 79 (999, 810,640)	41, 94, 59 (999, 963,849)	RI, MS
21	4-Terpinenol	562-74-3	$C_{10}H_{18}O$	154	1182	1179	93, 71, 69 (999, 856,683)	71, 43, 93 (999, 544,505)	RI, MS
22	2-(4-Methylphenyl)-2-propanol	1197-01-9	$C_{10}H_{14}O$	150	1187	1186	135, 43,133 (999, 948,755)	43, 135,91 (999, 801,214)	RI, MS
23	cis-Verbenol	18881-04-4	$C_{10}H_{16}O$	152	1188	1188	67, 109,91 (999, 944,917)	94, 109,41 (999, 877,622)	RI, MS
24	α-Terpineol	98-55-5	$C_{10}H_{18}O$	154	1194	1193	93, 121,79 (999, 766,711)	59, 93, 121 (999, 909,555)	RI, MS
25	2-Pinen-10-ol	515-00-4	$C_{10}H_{16}O$	152	1202	1194	91, 92, 79 (999, 580,451)	79, 91, 41 (999, 421,274)	RI, MS
26	cis-p-Menth-1-en-3-ol	16721-38-3	$C_{10}H_{18}O$	154	1207	1204	91, 79, 43 (999, 997,748)	84, 41, 43 (999, 561,383)	RI, MS
27	cis-Geraniol	106-25-2	$C_{10}H_{18}O$	154	1218	1217	93, 71, 91 (999, 530,525)	69, 93, 41 (999, 960,942)	RI, MS

28	Cinerone	17190-71-5	$C_{10}H_{14}O$	150	1247	1238[c]	107, 150,43 (999, 641,564)	150, 95,135 (999, 665,600)	RI, MS
29	3-Methyl-2-[(2Z)-2-pentenyl]cyclopentanol	137303-64-1	$C_{11}H_{20}O$	168	1306	1315[c]	91, 107,79 (999, 914,837)	95, 121,107 (999, 875,854)	RI, MS
30	exo-2-Hydroxycineole acetate	57709-95-2	$C_{12}H_{20}O_3$	212	1322	1354	111, 43,126 (999, 819,758)	43, 71, 108 (999, 374,324)	MS
31	1,4,4-Trimethylcyclohex-2-enecarboxylic acid	103262-04-0	$C_{10}H_{16}O_2$	168	1328	1327[c]	97, 43, 107 (999, 991,984)	123, 107,81 (999, 299,281)	RI, MS
32	δ-Elemene	20307-84-0	$C_{15}H_{24}$	204	1337	1335	121, 93,91 (999, 642,403)	121, 93,41 (999, 914,657)	RI, MS
33	Isoledene	N/A	$C_{15}H_{24}$	204	1370	1373	161, 105,91 (999, 984,750)	161, 105,119 (999, 896,502)	RI, MS
34	Copaene	3856-25-5	$C_{15}H_{24}$	204	1378	1375	105, 119,161 (999, 883,828)	119, 105,161 (999, 965,939)	RI, MS
35	β-Cubebene	13744-15-5	$C_{15}H_{24}$	204	1390	1393	161, 105,91 (999, 560,551)	161, 105,91 (999, 343,304)	RI, MS
36	Caryophyllene	87-44-5	$C_{15}H_{24}$	204	1429	1428	133, 91,105 (999, 934,617)	93, 133,91 (999, 921,858)	RI, MS
37	α-Guaiene	3691-12-1	$C_{15}H_{24}$	204	1437	1440	105, 91,147 (999, 777, 766)	105, 107,93 (999, 772, 749)	RI, MS
38	8-Isopropyl-1-methyl-5-methylene-1,6-cyclodecadiene	23986-74-5	$C_{15}H_{24}$	204	1455	1464	161, 105,91 (999, 695,543)	161, 105,91 (999, 775,685)	RI, MS
39	α-Caryophyllene	6753-98-6	$C_{15}H_{24}$	204	1460	1459	93, 91, 67 (999, 491,339)	93, 41, 80 (999, 517,394)	RI, MS
40	α-Curcumene	644-30-4	$C_{15}H_{22}$	202	1483	1482	132, 119,105 (999, 666,461)	132, 119,41 (999, 968,660)	RI, MS
41	Valencene	4630-07-3	$C_{15}H_{24}$	204	1491	1499	105, 91,93 (999, 977,893)	161, 41,93 (999, 744,682)	RI, MS
42	α-Muurolene	31983-22-9	$C_{15}H_{24}$	204	1497	1494.6	105, 161,91 (999, 934,723)	105, 161,41 (999, 481,456)	RI, MS
43	4-Isopropyl-1,7-dimethyl-2,7-cyclodecadien-1-ol	72120-50-4	$C_{15}H_{26}O$	222	1521	1511	161, 205,207 (999, 962,922)	81, 43, 41 (999, 766,394)	RI, MS
44	Eremophilene	10219-75-7	$C_{15}H_{24}$	204	1527	1530	107, 93,119 (999, 696,615)	161, 41,93 (999, 744,678)	RI, MS
45	α-Bulnesene	3691-11-0	$C_{15}H_{24}$	204	1540	1526	93, 91, 67 (999, 691,631)	107, 108,93 (999, 994,959)	MS
46	Germacra-1(10),4,7(11)-triene	15423-57-1	$C_{15}H_{24}$	204	1563	1560	121, 93,107 (999, 878,751)	121, 93,41 (999, 692,667)	RI, MS
47	Epoxycaryophyllene	1139-30-6	$C_{15}H_{24}O$	220	1585	1581	91, 79, 93 (999, 979,753)	43, 41, 79 (999, 687,660)	RI, MS
48	Spathulenol	6750-60-3	$C_{15}H_{24}O$	220	1629	1601	91, 119,105 (999, 895,670)	43, 41, 205 (999, 627,614)	MS

49	Cedr-8-en-13-ol	18319-35-2	$C_{15}H_{24}O$	220	1632	1657	203, 119,91 (999, 848,803)	119, 41,91 (999, 639,591)	MS
50	Cedr-8-en-15-ol	21441-72-5	$C_{15}H_{24}O$	220	1639	1646[c]	136, 91,119 (999, 625,462)	135, 41,79 (999, 794,792)	RI, MS
51	Torreyol	19435-97-3	$C_{15}H_{26}O$	222	1645	1646	161, 119,105 (999, 540,479)	161, 43,119 (999, 986,560)	RI, MS
52	.tau.-Muurolol	19912-62-0	$C_{15}H_{26}O$	222	1655	1647	95, 121,93 (999, 789,780)	43, 161,95 (999, 494,467)	RI, MS
53	Santalol	11031-45-1	$C_{15}H_{24}O$	220	1668	1668[c]	91, 79, 107 (999, 730,630)	93, 121,94 (999, 688,625)	RI, MS
54	α-Bisabolol	515-69-5	$C_{15}H_{26}O$	222	1683	1684	119, 109,67 (999, 864,787)	43, 41, 69 (999, 893,803)	RI, MS

[a]: experimental RI;

[b]: RI in database;

[c]: experimental characteristic MS peaks;

[d]: characteristic MS peaks in database;

[e]: estimated RI in database, perhaps not accurate;

MW: molecular weight;

ID: identification;

N/A: not applicable.