

## SUPPLEMENTARY INFORMATION

### **Design and application of a paper-based optoelectronic nose for the on-site discrimination of essential oils using a chemometric web app**

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### Preparation of dyes solutions used in the optoelectronic nose

Each dye used in this study was prepared by weighing an appropriate mass and dissolved in a convenient solvent. The concentration of each dye was 1 mg mL<sup>-1</sup>. Table S1 shows in which solvent each dye was prepared.

**Table S1.** Preparation of dyes used in the colorimetric sensor array.

Spot	Dye	Solvent
1	Mn-TPY	Dichloromethane/ethanol (90:10)
2	Methyl orange	H <sub>2</sub> O
3	Bromocresol green	Ethanol
4	Methyl Red	Ethanol
5	Alizarin	H <sub>2</sub> O
6	Nile Red	Ethanol
7	Eriocromiocyanin	0,01 M HCl
8	Disperse Orange	Acetone
9	2,4-DNPH	Ethanol/HCl/H <sub>2</sub> O



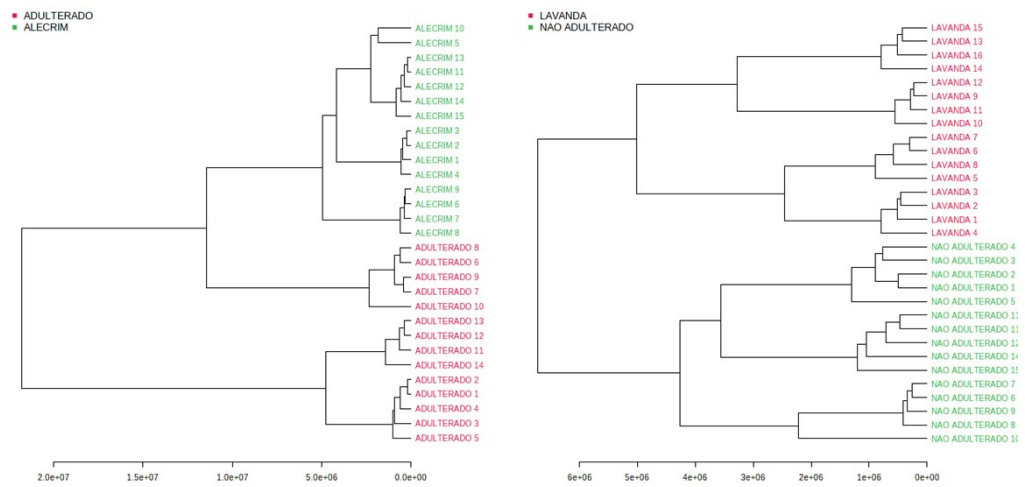
**Figure S2.** Euclidean distances versus time after exposure to the essential oil mixtures.

**Table S2.** 3 to 8 bits equivalence for color enhancement.

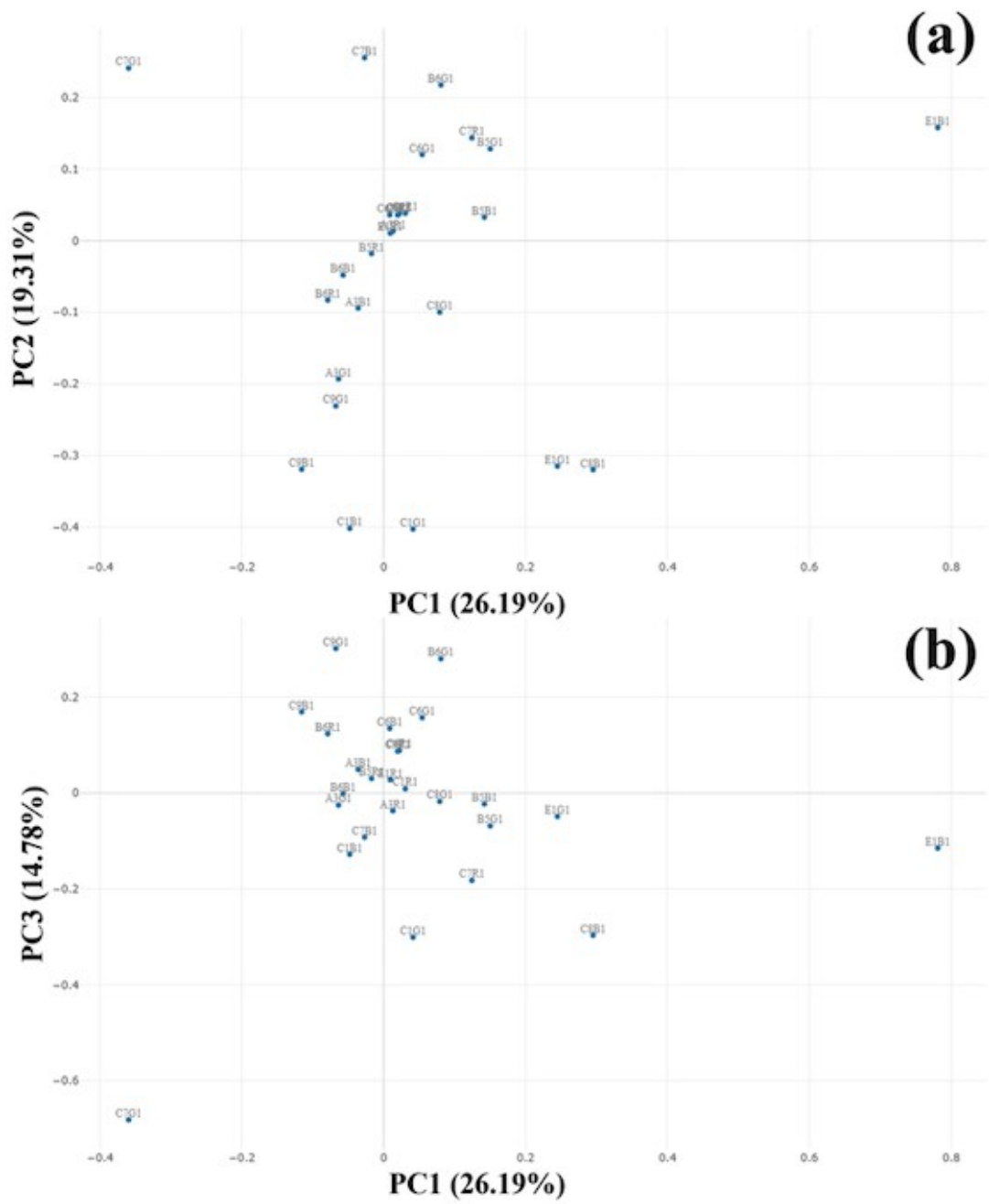
3 Bits Value)	8 bits Value	3 Bits Value)	8 bits Value	3 Bits Value)	8 bits Value	3 Bits Value)	8 bits Value
0	1	2	65	4	129	6	191
0,03125	2	2,03125	66	4,03125	130	6,03125	192
0,0625	3	2,0625	67	4,0625	131	6,0625	193
0,09375	4	2,09375	68	4,09375	132	6,09375	194
0,125	5	2,125	69	4,125	133	6,125	195
0,15625	6	2,15625	70	4,15625	134	6,15625	196
0,1875	7	2,1875	71	4,1875	135	6,1875	197
0,21875	8	2,21875	72	4,21875	136	6,21875	198
0,25	9	2,25	73	4,25	137	6,25	199
0,28125	10	2,28125	74	4,28125	138	6,28125	200
0,3125	11	2,3125	75	4,3125	139	6,3125	201
0,34375	12	2,34375	76	4,34375	140	6,34375	202
0,375	13	2,375	77	4,375	141	6,375	203
0,40625	14	2,40625	78	4,40625	142	6,40625	204
0,4375	15	2,4375	79	4,4375	143	6,4375	205
0,46875	16	2,46875	80	4,46875	144	6,46875	206
0,5	17	2,5	81	4,5	145	6,5	207
0,53125	18	2,53125	82	4,53125	146	6,53125	208
0,5625	19	2,5625	83	4,5625	147	6,5625	209
0,59375	20	2,59375	84	4,59375	148	6,59375	210
0,625	21	2,625	85	4,625	149	6,625	211
0,65625	22	2,65625	86	4,65625	150	6,65625	212
0,6875	23	2,6875	87	4,6875	151	6,6875	213
0,71875	24	2,71875	88	4,71875	152	6,71875	214
0,75	25	2,75	89	4,75	153	6,75	215
0,78125	26	2,78125	90	4,78125	154	6,78125	216
0,8125	27	2,8125	91	4,8125	155	6,8125	217
0,84375	28	2,84375	92	4,84375	156	6,84375	218
0,875	29	2,875	93	4,875	157	6,875	219
0,90625	30	2,90625	94	4,90625	158	6,90625	220
0,9375	31	2,9375	95	4,9375	159	6,9375	221
0,96875	32	2,96875	96	4,96875	160	6,96875	222
1	33	3	97	5	161	7	223
1,03125	34	3,03125	98	5,03125	162	7,03125	224
1,0625	35	3,0625	99	5,0625	163	7,0625	225

1,09375	36	3,09375	100	5,09375	164	7,09375	226
1,125	37	3,125	101	5,125	165	7,15625	227
1,15625	38	3,15625	102	5,15625	166	7,1875	228
1,1875	39	3,1875	103	5,1875	167	7,21875	229
1,21875	40	3,21875	104	5,21875	168	7,25	230
1,25	41	3,25	105	5,25	169	7,28125	231
1,28125	42	3,28125	106	5,28125	170	7,3125	232
1,3125	43	3,3125	107	5,3125	171	7,34375	233
1,34375	44	3,34375	108	5,34375	172	7,375	234
1,375	45	3,375	109	5,375	173	7,40625	235
1,40625	46	3,40625	110	5,40625	174	7,4375	236
1,4375	47	3,4375	111	5,4375	175	7,46875	237
1,46875	48	3,46875	112	5,46875	176	7,5	238
1,5	49	3,5	113	5,5	177	7,53125	239
1,53125	50	3,53125	114	5,53125	178	7,5625	240
1,5625	51	3,5625	115	5,5625	179	7,59375	241
1,59375	52	3,59375	116	5,59375	180	7,625	242
1,625	53	3,625	117	5,625	181	7,65625	243
1,65625	54	3,65625	118	5,65625	182	7,6875	244
1,6875	55	3,6875	119	5,6875	183	7,71875	245
1,71875	56	3,71875	120	5,71875	184	7,75	246
1,75	57	3,75	121	5,75	185	7,78125	247
1,78125	58	3,78125	122	5,78125	186	7,8125	248
1,8125	59	3,8125	123	5,8125	187	7,84375	249
1,84375	60	3,84375	124	5,84375	188	7,875	250
1,875	61	3,875	125	5,875	189	7,90625	251
1,90625	62	3,90625	126	5,90625	188	7,9375	252
1,9375	63	3,9375	127	5,9375	189	7,96875	253
1,96875	64	3,96875	128	5,96875	190	8	254

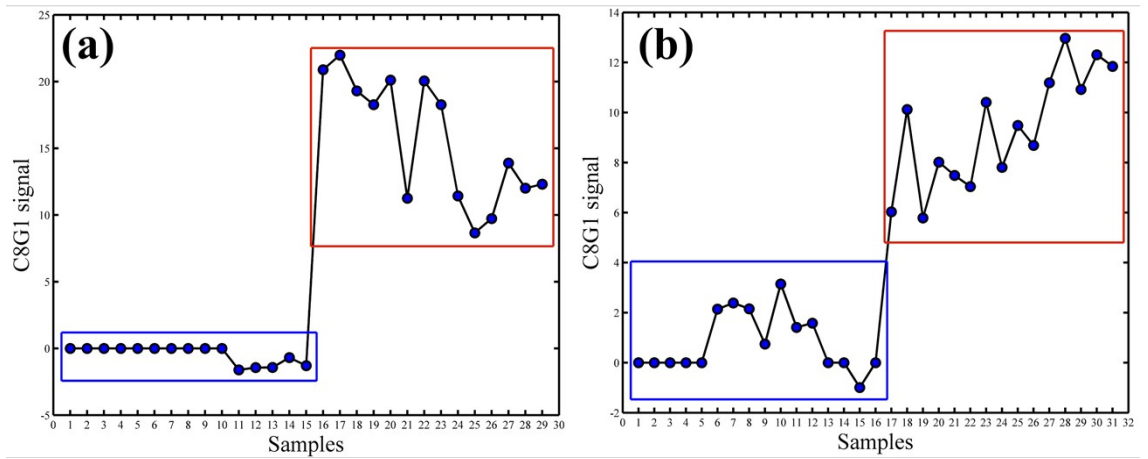
## Classification of essential oils adulterated and non-adulterated by statistical tools



**Figure S3.** Hierarchical cluster analysis of the colorimetric array response to the essential oils adulterated and non-adulterated (A) rosemary (B) lavender.



**Figure S4** Loadings plot of the RobPCA model for (a) PC1xPC2 and (b) PC1xPC3.



**Figure S5.** Plot of C8G1 variable versus the samples for Rosemary (a) and lavender (b). The rectangles were manually added to highlight the differences between the adulterated (red line) from the non-adulterated (blue line) samples.