

Table 1 Suppl. Two-way ANOVA analysis for leaves using treatment duration and As concentration as independent variables. NS - not significant, *, **, *** - significant at $P < 0.05$, $P < 0.01$, and $P < 0.001$, respectively.

Parameters	Duration	Concentration	Duration ×concentration
SOD	***	***	***
CAT	**	***	NS
MDA	***	***	***
POX	NS	***	*
APX	***	***	***
GR	***	***	***
GSH	***	NS	NS
Thiols	***	***	***
Phenols	***	***	***
Proline	***	***	**

Table 2 Suppl. Two-way ANOVA analysis for roots using treatment duration and As concentration as independent variables. NS -not significant, *, **, *** - significant at $P < 0.05$, $P < 0.01$, and $P < 0.001$, respectively.

Parameters	Duration	Concentration	Duration ×concentration
SOD	***	***	***
CAT	NS	***	NS
MDA	***	***	**
POX	***	***	***
APX	NS	***	NS
GR	**	***	***
GSH	NS	***	NS
Thiols	***	***	***
Phenols	***	***	***
Proline	**	***	NS

Table 3 Suppl. Major compounds identified in essential oil extracted from *Artemisia annua* leaves and roots of control and As treated plants. Means $\pm$ SE, $n = 3$, NS -not significant, *, **, *** - significant at $P < 0.05$, $P < 0.01$, and $P < 0.001$, respectively.

Compounds	Groups	Area [%] control	treated	<i>t</i> -value
Leaves				
Camphene	alkene	0.98 ± 0.08	1.16 ± 0.94	0.31 ^{NS}
α -Pinene	alkene	0.57 ± 0.05	0.94 ± 0.08	21.36**
β -Pinene	alkene	0.38 ± 0.04	0.79 ± 0.07	23.67**
Pinocarvone	ketone	0.33 ± 0.02	1.44 ± 0.04	96.12***
β -Caryophyllene	alkene	7.37 ± 2.18	11.73 ± 4.05	4.03 ^{NS}
β-Farnesene	alkene	10.15 ± 4.20	16.12 ± 4.50	34.46**
Germacrene A	alkene	0.23 ± 0.19	1.29 ± 0.97	2.35 ^{NS}
Himachalol	alcohol	1.62 ± 0.98	3.71 ± 0.20	4.64*
γ- Selinene	alkene	0.59 ± 0.03	1.22 ± 0.95	1.16 ^{NS}
Spathulenol	alcohol	0.32 ± 0.04	1.67 ± 0.84	2.92 ^{NS}
Roots				
β-Bergamotene	alkene	12.23 ± 2.00	15.20 ± 2.41	12.54*
β-caryophyllene	alkene	2.81 ±1.00	4.18 ± 1.50	4.74*
β-Selinene	alkene	0.73 ± 0.01	1.44 ± 0.07	15.37**
α-Isocomene	alkene	1.49 ± 0.08	1.68 ± 0.55	0.70 ^{NS}
β-Isocomene	alkene	1.33 ± 0.01	1.68 ± 0.84	0.73 ^{NS}
Modhephene	alkene	2.56±1.02	3.42±0.29	2.04 ^{NS}
Seychellene	alkene	0.21 ± 0.01	0.34 ± 0.02	22.51**
Silphiperfol-5-ene	alkene	0.18 ± 0.05	0.25 ± 0.06	12.12*
Silphiperfol-5-ene <7- epi->	alkene	1.26 ± 0.75	1.60 ± 0.90	3.92 ^{NS}
Spathulenol	alcohol	1.65 ± 0.15	2.18 ± 1.10	0.97 ^{NS}
Linoleic acid	unsaturated fatty acid	-	4.85 ± 0.03	-

Table 4 Suppl. Components of essential oil from leaves of As treated and control *Artemisia annua* plants. Means $\pm$ SE, $n = 3$, NS - not significant, *, **, *** - significant at $P < 0.05$, $P < 0.01$, and $P < 0.001$, respectively.

Compounds	Groups	Area [%]		<i>t</i> -value
		control	treated	
1,8-Cineole	ether	4.71 $\pm$ 0.04	3.16 $\pm$ 0.09	53.69***
α -Terpineol	alcohol	0.51 $\pm$ 0.04	0.29 $\pm$ 0.01	12.70*
Camphene	alkene	0.98 $\pm$ 0.08	1.16 $\pm$ 0.94	0.31 ^{NS}
Camphor	ketone	29.41 $\pm$ 2.10	26.92 $\pm$ 2.4	14.37**
<i>Trans</i> -Carveol	alcohol	0.83 $\pm$ 0.08	0.60 $\pm$ 0.03	3.62 ^{NS}
<i>Cis</i> -Carveol	alcohol	0.25 $\pm$ 0.02	0.22 $\pm$ 0.01	1.73 ^{NS}
Carvone	ketone	0.27 $\pm$ 0.01	0.17 $\pm$ 0.02	17.32**
Citronellol	alcohol	8.33 $\pm$ 2.90	5.08 $\pm$ 2.41	11.49*
P-Cymene	alkene	1.12 $\pm$ 0.09	0.51 $\pm$ 0.04	21.13**
Isoborneol	alcohol	0.07 $\pm$ 0.02	0.25 $\pm$ 0.02	-
Jasmone	ketone	0.27 $\pm$ 0.01	0.20 $\pm$ 0.01	-
Lavandulyl acetate	ester	0.20 $\pm$ 0.03	0.33 $\pm$ 0.02	22.51**
Limonene oxide	alkene	2.81 $\pm$ 0.21	1.12 $\pm$ 0.98	3.78 ^{NS}
Myrcene	alkene	0.30 $\pm$ 0.01	0.10 $\pm$ 0.05	8.66*
Myrtenol	alcohol	0.41 $\pm$ 0.02	0.20 $\pm$ 0.01	36.37**
α -Pinene	alkene	0.57 $\pm$ 0.05	0.94 $\pm$ 0.08	21.36**
β -Pinene	alkene	0.38 $\pm$ 0.04	0.79 $\pm$ 0.07	23.67**
Pinocarvone	ketone	0.33 $\pm$ 0.02	1.44 $\pm$ 0.04	96.12***
Sabinene	alkene	0.26 $\pm$ 0.08	0.24 $\pm$ 0.09	3.46 ^{NS}
γ -Terpinene	alkene	0.34 $\pm$ 0.05	0.13 $\pm$ 0.06	36.37**
4-Terpineol	alcohol	1.47 $\pm$ 0.08	1.08 $\pm$ 0.09	67.55***
Thujopsanone	ketone	0.44 $\pm$ 0.03	0.56 $\pm$ 0.03	3.46 ^{NS}
Verbenol	alcohol	0.38 $\pm$ 0.02	0.22 $\pm$ 0.01	9.23*
Acetyl cedrene	alkene	0.57 $\pm$ 0.09	0.20 $\pm$ 0.03	10.68*
Aristolene epoxide	alkene	0.32 $\pm$ 0.01	0.13 $\pm$ 0.05	8.22*
Aristolone	ketone	0.15 $\pm$ 0.08	0.21 $\pm$ 0.03	2.07 ^{NS}
α -Bisabolol	alcohol	0.63 $\pm$ 0.03	0.23 $\pm$ 0.01	34.64**
γ -Cadinene	alkene	1.10 $\pm$ 0.11	0.37 $\pm$ 0.04	18.06**
β -Cadinene	alkene	0.30 $\pm$ 0.01	0.15 $\pm$ 0.02	25.98**
β -Caryophyllene	alkene	7.37 $\pm$ 2.18	11.73 $\pm$ 4.05	4.03 ^{NS}
Iso-Caryophyllene	alkene	1.75 $\pm$ 0.09	1.66 $\pm$ 0.09	1.70 ^{NS}
β -Copaene	alkene	5.15 $\pm$ 1.60	3.94 $\pm$ 1.02	3.61 ^{NS}
α -Copaene	alkene	0.37 $\pm$ 0.01	0.72 $\pm$ 0.05	15.15**
Corymbolone	ketone	0.15 $\pm$ 0.01	0.22 $\pm$ 0.01	-
Cubebanol	alcohol	0.36 $\pm$ 0.02	0.25 $\pm$ 0.02	-
Cyclocolorenone	ketone	1.67 $\pm$ 0.79	1.12 $\pm$ 0.97	5.47*
Dihydromayurone	ketone	0.27 $\pm$ 0.03	0.09 $\pm$ 0.00	12.47*
β -Farnesene	alkene	10.15 $\pm$ 4.2	16.12 $\pm$ 4.50	34.46**
Farnesol	alcohol	0.12 $\pm$ 0.07	0.04 $\pm$ 0.01	2.30 ^{NS}
γ -Elemen	alkene	1.24 $\pm$ 0.98	0.83 $\pm$ 0.02	0.74 ^{NS}
Germacrene A	alkene	0.23 $\pm$ 0.19	1.29 $\pm$ 0.97	2.35 ^{NS}
Himachalol	alcohol	1.62 $\pm$ 0.98	3.71 $\pm$ 0.20	4.64*
α -humulene	alkene	0.28 $\pm$ 0.01	0.13 $\pm$ 0.08	3.71 ^{NS}
Intermedeol	alcohol	1.54 $\pm$ 0.02	0.92 $\pm$ 0.01	107.38***
Isogeranial	-	0.19 $\pm$ 0.05	0.07 $\pm$ 0.00	4.33*
Lanceol acetate	ester	0.34 $\pm$ 0.02	0.28 $\pm$ 0.01	3.46 ^{NS}
Longifolol	alcohol	0.73 $\pm$ 0.05	0.74 $\pm$ 0.06	1.73 ^{NS}
Longipinocarvone	ketone	0.15 $\pm$ 0.05	0.13 $\pm$ 0.01	0.58 ^{NS}
γ -Selinene	alkene	0.59 $\pm$ 0.03	1.22 $\pm$ 0.95	1.16 ^{NS}
α -Selinene	alkene	0.48 $\pm$ 0.01	0.51 $\pm$ 0.03	2.59 ^{NS}
β -Selinene	alkene	0.39 $\pm$ 0.02	0.40 $\pm$ 0.02	-
Spathulenol	alcohol	0.32 $\pm$ 0.04	1.67 $\pm$ 0.84	2.92 ^{NS}
Larixol	alcohol	1.61 $\pm$ 0.85	1.19 $\pm$ 0.04	0.89 ^{NS}
Phytol	alcohol	0.17 $\pm$ 0.05	0.11 $\pm$ 0.01	2.43 ^{NS}
1, 2-benzenedicarboxylic acid, bis (2-methylpropyl) ester	-	0.10 $\pm$ 0.001	0.21 $\pm$ 0.05	3.88 ^{NS}

3-Decanone	ketone	1.04 ± 0.97	0.51± 0.02	0.96 ^{NS}
Butanoate <2-methyl-, (3Z)-(hexenyl)	-	0.11 ± 0.01	0.18 ± 0.04	4.04 ^{NS}
Butyrate <2-methylbutyl-, 2-methyl->	-	1.27 ± 0.94	0.73 ± 0.06	0.93 ^{NS}
	total	97.25 %	97.89 %	

Table 5 Suppl. Components of essential oil from roots of Arsenic (As) untreated and treated *Artemisia annua*. Means $\pm$ SE, $n = 5$, NS - not significant, *, **, *** - significant at $P < 0.05$, $P < 0.01$, and $P < 0.001$, respectively.

Compounds	Groups	Area [%]		t -value
		control	treated	
Cymene	alkene	0.03 ± 0.008	0.02 ± 0.005	5.77*
Isoeugenol	alcohol	4.34 ± 0.005	0.30 ± 0.001	1.70***
Sesquicineole <7-epi-1,2- dehydro>	alcohol	0.27 ± 0.002	0.38 ± 0.02	10.26*
α -terpineol	alcohol	0.02 ± 0.001	-	
(Z)-valerenyl acetate	ester	1.32 ± 0.092	1.00 ± 0.08	46.18***
Arteannuic alcohol	alcohol	15.46 ± 4.20	13.41 ± 3.12	0.48 ^{NS}
α -Agarofuran		1.06 ± 0.001	-	
β -Bergamotene	alkene	12.23 ± 2.00	15.20 ± 2.41	12.54*
β -caryophyllene	alkene	2.81 ± 1.00	4.18 ± 1.50	4.74*
β -Caryophyllene oxide	alkene	-	1.26 ± 0.001	
β -Elemene	alkene	2.22 ± 1.20	1.49 ± 0.09	1.13 ^{NS}
β -Ionone	ketone	0.66 ± 0.05	0.22 ± 0.01	19.05**
β -Selinene	alkene	0.73 ± 0.01	1.44 ± 0.07	20.49**
β -Humulene	alkene	0.36 ± 0.001	-	
β -Sinensa		0.64 ± 0.002	-	
Bicyclogermacrene	alkene	1.33 ± 0.095	0.48 ± 0.035	24.53**
β -Bisabolene	alcohol	-	0.85 ± 0.03	
Campherenone	ketone	1.25 ± 0.92	0.89 ± 0.069	0.73 ^{NS}
Caryophyllene	alkene	6.63 ± 2.10	3.54 ± 0.29	4.41 ^{NS}
Cedrane-diol	alcohol	1.96 ± 0.91	1.23 ± 0.94	35.83**
Cedranone	ketone	7.52 ± 3.41	3.75 ± 1.2	1.41 ^{NS}
Cedrenol acetate	alcohol	0.76 ± 0.02	0.48 ± 0.03	48.49***
Cedrene	alkene	0.48 ± 0.02	0.32 ± 0.06	6.92*
Cis 8 Isopropylbicyclo[4.3.0] non-3-ene	alkene	-	1.87 ± 0.05	
Caryophylla-4(12),8(13)-dien5-beta-ol)	alcohol	-	0.28 ± 0.01	
Cadina-1(6),4-diene	alkene	-	0.54 ± 0.02	
Cadinol	alcohol	-	0.19 ± 0.04	
Davanone D	ketone	-	0.43 ± 0.03	
α -Elemol <alpha->	alcohol	0.08 ± 0.002	0.15 ± 0.012	12.12*
Farnesyl acetate	ester	-	0.26 ± 0.015	
Germacrene D	alkene	0.24 ± 0.02	0.36 ± 0.04	10.39*
Intermodeol	alcohol	0.38 ± 0.02	0.25 ± 0.024	56.29***
α -Isocomene	alkene	1.49 ± 0.08	1.68 ± 0.55	0.70 ^{NS}
β -Isocomene	alkene	1.33 ± 0.01	1.68 ± 0.84	0.73 ^{NS}
Isoshyobunone	ketone	5.02 ± 2.00	4.75 ± 1.20	0.58 ^{NS}
Lanceol	alcohol	0.98 ± 0.08	0.32 ± 0.02	19.05**
Larixol	alcohol	-	0.28 ± 0.04	
Longifolenaldehyde	aldehyde	1.42 ± 0.02	-	
Longipinanol	alcohol	0.61 ± 0.01	-	
Modhephene	alkene	2.56 ± 1.02	3.42 ± 0.29	2.04 ^{NS}
Nopinone	ketone	0.14 ± 0.04	0.15 ± 0.003	0.47 ^{NS}
Nerolidol	alcohol	-	1.35 ± 0.05	
Selina-4,11-diene	alkene	0.09 ± 0.004	0.24 ± 0.02	16.23**
Seychellene	alkene	0.21 ± 0.01	0.34 ± 0.02	22.51**
Silphinene	alkene	0.05 ± 0.03	0.08 ± 0.004	1.99 ^{NS}
Silphiperfol-5-ene	alkene	0.18 ± 0.05	0.25 ± 0.06	12.12*
Silphiperfol-5-ene <7-epi->	alkene	1.26 ± 0.75	1.60 ± 0.90	3.92 ^{NS}
Spathulenol	alcohol	1.65 ± 0.15	2.18 ± 1.10	0.97 ^{NS}
Trans-caryophyllen	alkene	-	0.42 ± 0.02	
Valencene	alkene	-	1.05 ± 0.01	
Phytol	alcohol	0.20 ± 0.01	0.19 ± 0.03	0.87 ^{NS}
1,1'-Biphenyl, 4-(hydroxyacetyl)-		2.78 ± 1.1	0.70 ± 0.06	72.05***
Capillene	benzene	2.83 ± 0.84	0.82 ± 0.04	4.35*
Decanoic acid	saturated fatty acid	0.49 ± 0.02	0.59 ± 0.07	3.46 ^{NS}
4-Caprylmorpholine	aliphatic carboxylic acid	-	3.84 ± 0.02	
Hexadecanoic	aliphatic carboxylic acids	-	4.27 ± 0.04	

Caprylmorpholine	aliphatic carboxylic acids	-	0.49 ± 0.05	
<i>n</i> -Butyro-morpholine	aliphatic hydrocarbon	0.85 ± 0.06	1.22 ± 0.08	32.04**
Simvastatin	polycyclic hydrocarbon	0.33 ± 0.04	0.16 ± 0.09	5.88*
Tetradecane	alkane	0.09 ± 0.004	0.10 ± 0.004	
Tridecanal	aldehyde	0.11 ± 0.01	0.24 ± 0.02	7.50*
Docosane -n	alkane	0.15 ± 0.002	0.35 ± 0.001	
Lignocero	saturated fatty acid	-	0.13 ± 0.05	
Linoleic acid	unsaturated fatty acid	-	4.85 ± 0.03	
Octadecanoic acid	saturated fatty acid	-	1.01± 0.004	
Total		87.78 %	93.52 %	

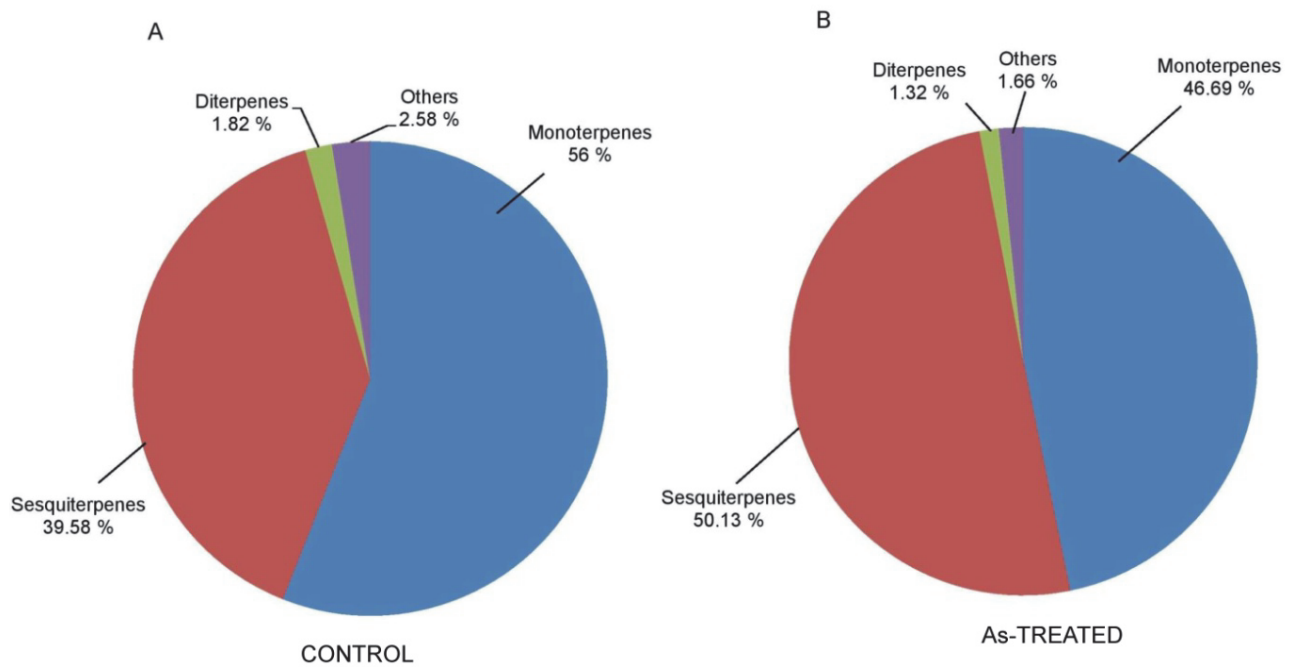


Fig. 1 Suppl. Pie chart representing relative amounts of essential oil components in control (A) and As treated (B) leaves of *Artemisia annua*

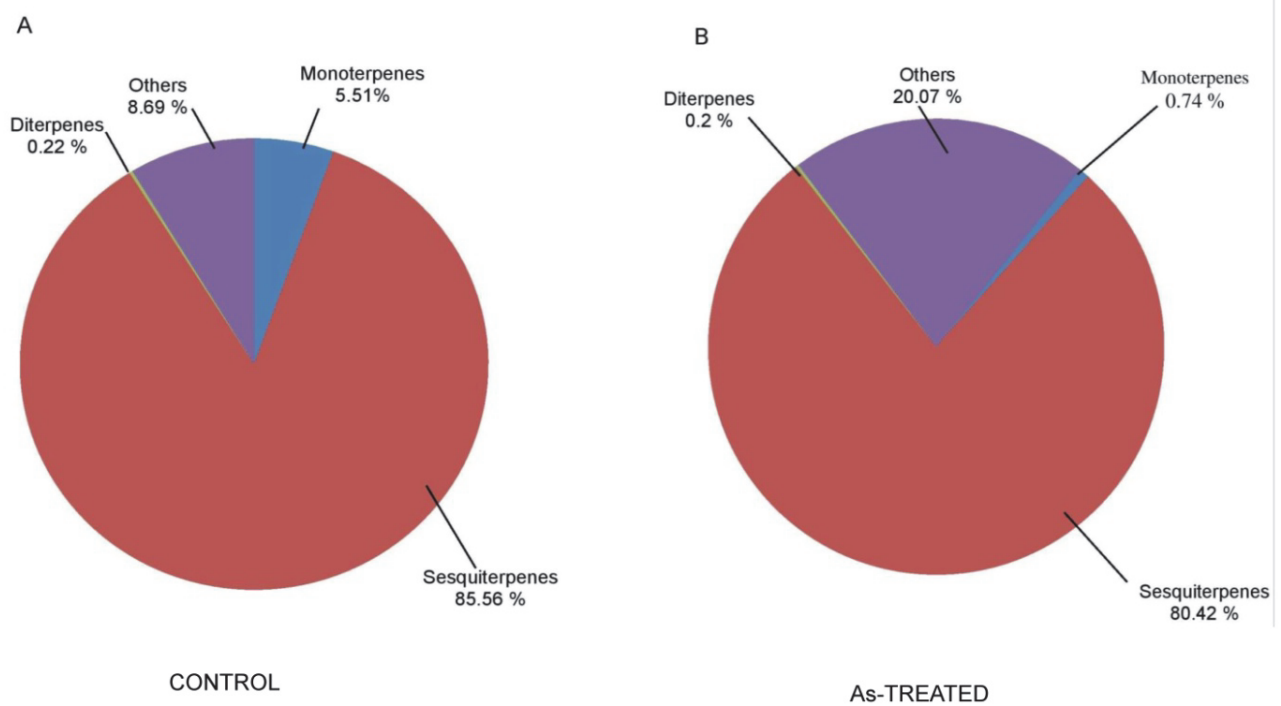


Fig. 2 Suppl. Pie chart representing relative amounts of essential oil components in control (A) and As treated (B) roots of *Artemisia annua*.

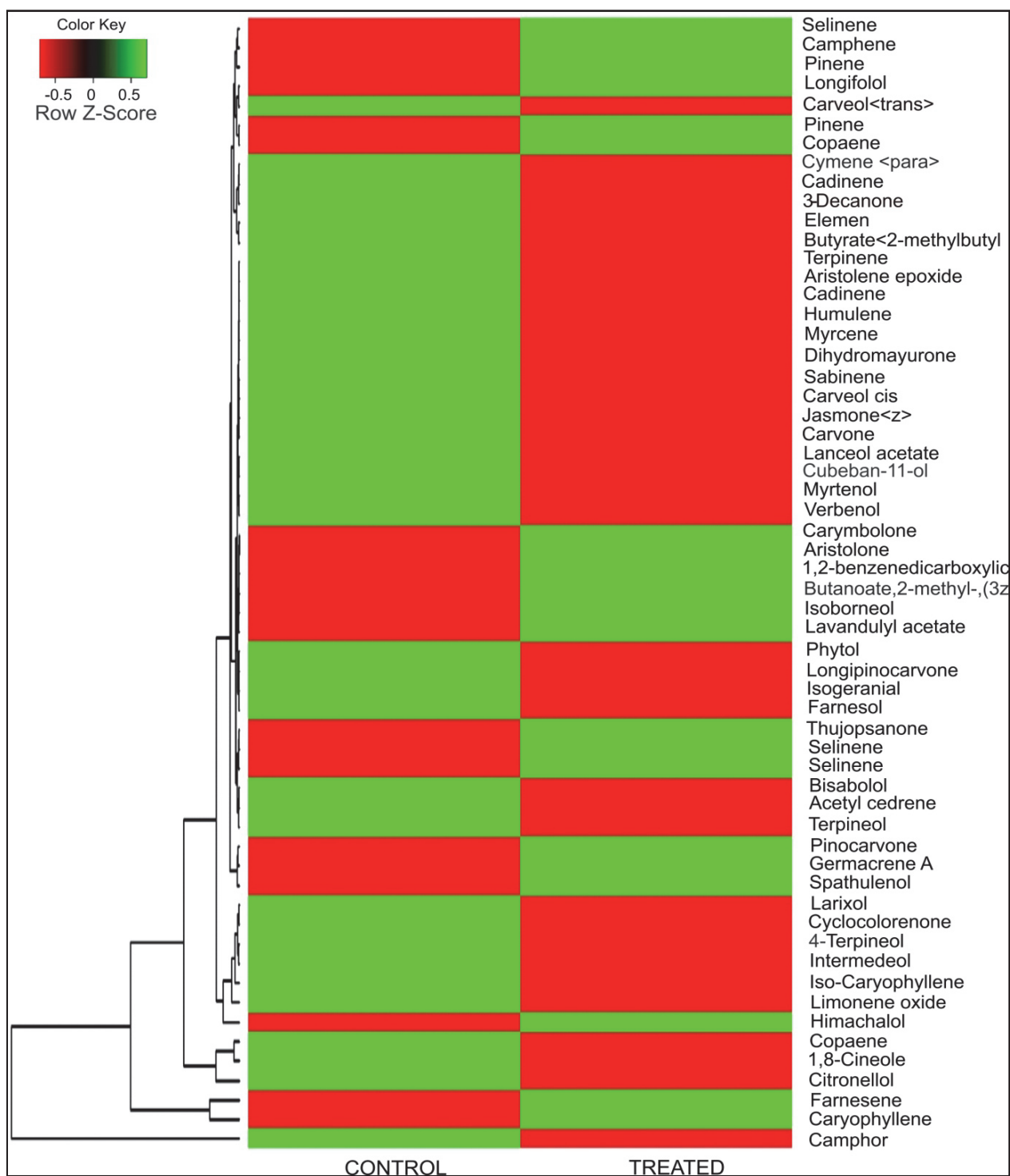


Fig. 3 Suppl. Heat map and clustering of essential oil components in leaves of *Artemisia annua*. Rows and columns represent individual secondary metabolite and treatment sets (control and treated with 100 μ M As for 3 d). Row dendrogram represents the secondary metabolites clustered with similar pattern. The abundance levels are mapped on the color scale provided at the left top of the figure.

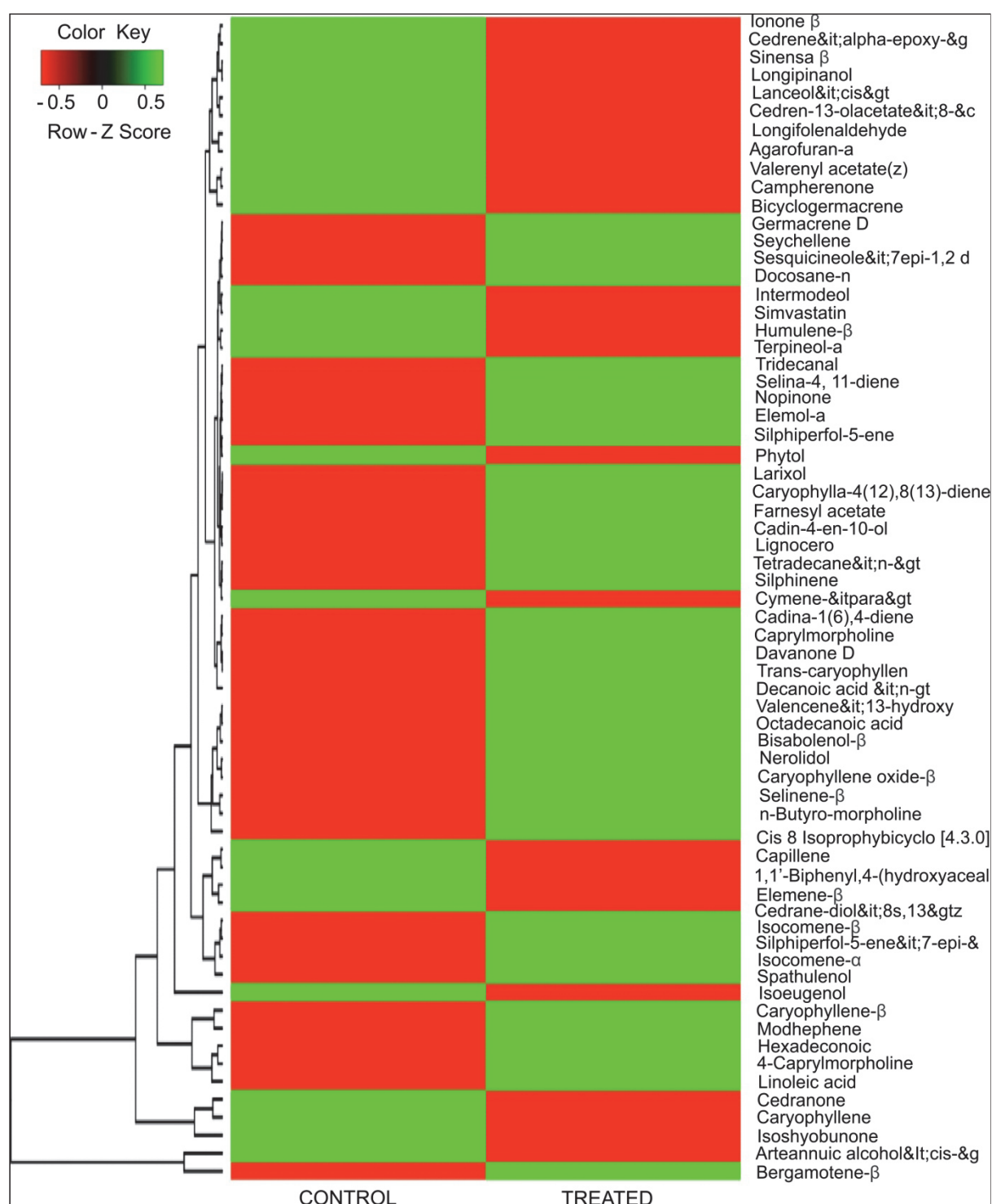


Fig. 4 Suppl. Heat map and clustering of essential oil components of roots in *Artemisia annua*. Rows and columns represent individual secondary metabolite and treatment sets (control and treated with 100 μM As for 3 d). Row dendrogram represents the secondary metabolites clustered with similar pattern. The abundance levels are mapped on the colour scale provided at the left top of the figure.