Supplemental material

Supplemental Table 1. Summary of two-way ANOVA results assessing the effects of wounded organ (i.e., leaf or stem), timing of wounding (i.e., 7 or 11 days pre-harvest), and their interaction (organ × timing) on cannabinoid concentrations. *F*-values, *P*-values, and partial eta-square (η^2p) are shown for each source of variation. Significant *p*-values ($P<0.05$) are shown in bold. When the interaction effect was not significant the reduced model was conducted and presented. For CBD, CBC, and CBDV, the corresponding neutral forms were lower than the detection limit; thus, only their acidic forms are reported.

Variable	Source	*F*-value	*p*-value	Partial η^2
THCA	Organ	7.4411	**0.0156**	0.33158
	Timing	7.649	**0.0144**	0.33772
	Organ*Timing	5.7206	**0.0303**	0.27608
THC	Organ	0.0057	0.9407	0.00033
	Timing	2.2137	0.1551	0.11521
	Organ*Timing			
Total THC	Organ	7.2309	**0.0168**	0.32526
	Timing	6.4547	**0.0226**	0.30085
	Organ*Timing	5.8124	**0.0292**	0.27928
CBCA	Organ	4.0835	0.0629	0.22581
	Timing	8.1276	**0.0128**	0.36731
	Organ*Timing	26.2068	**0.0002**	0.6518
CBGA	Organ	2.7186	0.1214	0.16261
	Timing	7.5722	**0.0156**	0.35102
	Organ*Timing			
CBG	Organ	1.1646	0.2965	0.06785
	Timing	0.1711	0.6847	0.01058
	Organ*Timing			
Total CBG	Organ	2.8088	0.1145	0.15772
	Timing	9.2217	**0.0083**	0.38072
	Organ*Timing			
CBDA	Organ	24.242	**0.0003**	0.65093
	Timing	2.7143	0.1234	0.17273
	Organ*Timing	12.3359	**0.0038**	0.48689
CBDVA	Organ	0.7503	0.3992	0.04479
	Timing	0.3631	0.5553	0.02219
	Organ*Timing	6.0866	**0.0253**	0.27558

For CBDVA, the two-way ANOVA detected a significant organ×timing interaction (Supp. Table 1), while no significant effects of organ or timing were identified by one-way ANOVA (Fig. 2E). This distinction stems from the intrinsic differences in the way the two statistical models handle variance. One-way ANOVA evaluates the groups independently, with individual influences of parameters (e.g., organ, timing) accumulating in the error term, thus reducing the statistical power to detect differences among individual groups. The two-way model considers both factors simultaneously, thereby lowering the overall error and increasing the statistical power of the test to reveal how the wounding response depends on both the organ and the timing of wounding.

Supplemental Table 2. Two-way ANOVA summary assessing the effects of wounded organ (i.e., leaf or stem), timing of wounding (i.e., 7 or 11 days pre-harvest), and their interaction (organ x timing) on monoterpene concentrations. *F*-values, *p*-values, and partial eta-square (η^2p) are shown for each source of variation. Significant *p*-values ($p<0.05$) are shown in bold. The organ × timing interaction effect was not significant for any of the monoterpenes; therefore, the reduced model was conducted and presented.

Variable	Source	*F*-value	*p*-value	Partial η^2
α-Pinene	Organ	12.0369	**0.0046**	0.50077
	Timing	17.9573	**0.0012**	0.59943
	Organ*Timing			
Camphene	Organ	3.305	0.0878	0.1712
	Timing	4.6672	**0.0463**	0.22583
	Organ*Timing			
β-Pinene	Organ	8.2201	**0.0118**	0.35401
	Timing	17.1334	**0.0009**	0.5332
	Organ*Timing			
β-Myrcene	Organ	2.6568	0.1271	0.16969
	Timing	1.3628	0.264	0.09489
	Organ*Timing			
Limonene	Organ	0.0716	0.7939	0.00647
	Timing	13.9810	**0.0033**	0.55967
	Organ*Timing			
(E)-*β*-Ocimene	Organ	14.8926	**0.0039**	0.62331
	Timing	6.5749	**0.0305**	0.42215
	Organ*Timing			
Fenchone	Organ	0.1642	0.691	0.01083
	Timing	2.6511	0.1243	0.15019
	Organ*Timing			
Linalool	Organ	1.8596	0.1942	0.11726
	Timing	19.5509	**0.0006**	0.58272
	Organ*Timing			
endo-Fenchol	Organ	0.9918	0.3362	0.06616
	Timing	0.4339	0.5208	0.03006
	Organ*Timing			
(*ζ*)-Pinene hydrate	Organ	0.2784	0.605	0.0171
	Timing	3.9476	0.0643	0.1979
	Organ*Timing			
Borneol	Organ	10.3952	**0.0061**	0.42612
	Timing	0.0001	0.9921	0.00001
	Organ*Timing			
α-terpineol	Organ	23.8556	**0.0004**	0.66532
	Timing	9.4239	**0.0097**	0.43988
	Organ*Timing			

Supplemental Table 3. Summary of two-way ANOVA results assessing the effects of wounded organ (leaf or stem), timing of wounding (7 or 11 days pre-harvest) and their interaction (organ x timing) on sesquiterpene concentrations. *F*-values, *p*-values, and partial eta-square (η^2p) are shown for each source of variation. Significant *p*-values ($P<0.05$) are shown in bold. When the interaction effect was not significant, the reduced model is presented.

Variable	Source	*F*-value	*p*-value	Partial η^2
α-Copaene	Organ	0.0184	0.8937	0.00108
	Timing	1.2508	0.279	0.06854
	Organ*Timing			
Hexyl hexanoate	Organ	13.3703	**0.0026**	0.4885
	Timing	1.8604	0.1941	0.1173
	Organ*Timing			
β-Isocomene	Organ	32.6227	**<.0001**	0.69972
	Timing	0.0505	0.8254	0.00359
	Organ*Timing			
E-Caryophyllene	Organ	7.2299	**0.0176**	0.34055
	Timing	0.9209	0.3535	0.06172
	Organ*Timing			
γ-Elemene	Organ	2.5164	0.1438	0.20105
	Timing	0.1392	0.7169	0.01372
	Organ*Timing			
(E)-α- Bergamotene	Organ	1.5707	0.2306	0.10088
	Timing	0.0677	0.7986	0.00481
	Organ*Timing			
(E)-β-Farnesene	Organ	38.6459	**<.0001**	0.74829
	Timing	4.6508	0.0503	0.26349
	Organ*Timing			
α-Humulene	Organ	8.5657	**0.011**	0.37959
	Timing	1.399	0.2566	0.09085
	Organ*Timing			
Selinene like	Organ	4.6312	**0.047**	0.22448
	Timing	2.0816	0.1684	0.11512
	Organ*Timing			
(E,E)-α-Farnesene	Organ	3.9682	0.0637	0.19872
	Timing	4.5702	**0.0483**	0.22218
	Organ*Timing			
β-Bisabolene	Organ	7.2446	**0.0185**	0.35785
	Timing	0.3283	0.5765	0.02463
	Organ*Timing			
Zonarene	Organ	134.9363	**<.0001**	0.91833
	Timing	35.5574	**<.0001**	0.74767
	Organ*Timing	13.4524	**0.0032**	0.52853
Selina-3,7(11)-diene	Organ	0.5612	0.4646	0.03389
	Timing	6.7138	**0.0197**	0.29558
	Organ*Timing			
Germacrene B	Organ	2.2298	0.1635	0.16854
	Timing	30.944	**0.0002**	0.73775
	Organ*Timing	6.1242	**0.0309**	0.35764
Caryophyllene oxide	Organ	14.9106	**0.0026**	0.57546
	Timing	18.6672	**0.0012**	0.62922
	Organ*Timing	9.2064	**0.0114**	0.45562

Supplemental table 4. Summary of two-way ANOVA results assessing the effects of wounded organ (i.e., leaf or stem), timing of wounding (i.e., 7 or 11 days pre-harvest) and their interaction (organ x timing) on physiological parameters: membrane leakage (ML); carotenoids; chlorophyll a; chlorophyll b; stem water content (Stem WC); leaf water content (Leaf WC); flower water content (Flower WC); relative water content (RWC), osmotic potential. *F*-values, *p*-values, and partial eta-square (η^2p) are shown for each source of variation. Significant *p*-values ($P<0.05$) are shown in bold. The reduced model is presented since the interaction was insignificant for all the tested parameters.

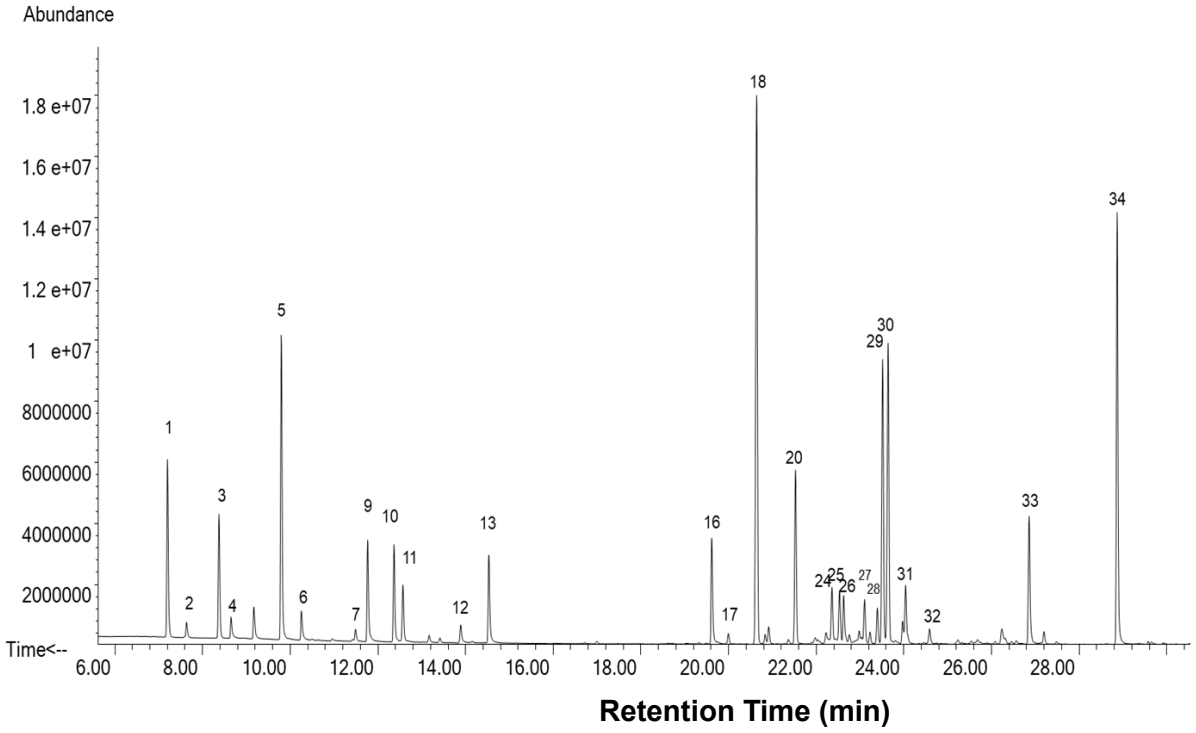
Variable	Source	*F*-value	*P*-value	Partial η^2
Membrane leakage	Organ	10.7971	**0.0094**	0.54539
	Timing	0.7405	0.4118	0.07602
	Organ*Timing			
Carotenoids	Organ	0.0037	0.9524	0.00025
	Timing	0.6115	0.4464	0.03917
	Organ*Timing			
Chlorophyll a	Organ	0.0935	0.764	0.00619
	Timing	0.4776	0.5001	0.03086
	Organ*Timing			
Chlorophyll b	Organ	0.4651	0.505	0.02825
	Timing	0.1571	0.6971	0.00972
	Organ*Timing			
Stem WC	Organ	3.0953	0.0965	0.15403
	Timing	0.3858	0.5428	0.02219
	Organ*Timing			
Leaf WC	Organ	0.7897	0.3866	0.04439
	Timing	0.0246	0.8772	0.00144
	Organ*Timing			
Flower WC	Organ	1.1104	0.3068	0.06131
	Timing	0.3997	0.5356	0.02297
	Organ*Timing			
RWC	Organ	0.654	0.4299	0.03704
	Timing	0.0138	0.9078	0.00081
	Organ*Timing			
Osmotic potential	Organ	1.4734	0.2424	0.08432
	Timing	0.4156	0.5283	0.02532
	Organ*Timing			

Supplemental Table 5. Comprehensive phytochemical profile, retention indices, and volatile composition of cannabis leaf MTBE extracts identified via GC-MS analysis.

RT, Retention Time; **RI**, Retention Index; **KI**, Kovats Index; **Cas**, Chemical Abstracts Service registry number; **MS**, Mass Spectrometry; **Std**, confirmed via authentic reference standard injection; **IS**, Internal Standard. * Tentatively identified constituent.

Compound Name	CAS No.	Chemical Class	RT (min)	Exp. RI	Lit. RI	Identification Method
α-Pinene	80-56-8	Monoterpene hydrocarbon	7.26	932	939	MS, RI
Camphene	579-92-5	Monoterpene hydrocarbon	7.58	946	954	MS, RI
β-Pinene	127-91-3	Monoterpene hydrocarbon	8.34	974	979	MS, RI
Myrcene	123-35-3	Monoterpene hydrocarbon	8.76	988	990	MS, RI, Std
Limonene	138-86-3	Monoterpene hydrocarbon	9.87	1024	1029	MS, RI, Std
(E)-β-Ocimene	3779-61-1	Monoterpene hydrocarbon	10.22	1034	1047	MS, RI
Fenchone	1195-79-5	Oxygenated monoterpene	11.31	1073	1083	MS, RI
Linalool	78-70-6	Oxygenated monoterpene	11.55	1082	1096	MS, RI, Std
endo-Fenchol	2217-02-9	Oxygenated monoterpene	12.33	1108	1111	MS, RI
cis-Pinene hydrate	471-20-5	Oxygenated monoterpene	13.01	1125	1136	MS, RI
trans-Pinene hydrate	19700-21-1	Oxygenated monoterpene	13.41	1133	1145	MS, RI
α-Terpineol	98-55-5	Oxygenated monoterpene	14.85	1176	1186	MS, RI, Std
α-Cubebene	17699-14-8	Sesquiterpene hydrocarbon	19.44	1338	1348	MS, RI
α-Copaene	3856-25-5	Sesquiterpene hydrocarbon	20.12	1367	1374	MS, RI
(Z)-β-Caryophyllene	118-65-4	Sesquiterpene hydrocarbon	20.76	1394	1400	MS, RI
(E)-β-Caryophyllene	87-44-5	Sesquiterpene hydrocarbon	21.15	1412	1417	MS, RI, Std
γ-Elemene	29873-99-2	Sesquiterpene hydrocarbon	21.44	1428	1434	MS, RI

Compound Name	CAS No.	Chemical Class	RT (min)	Exp. RI	Lit. RI	Identification Method
α-*trans*-Bergamotene	17699-15-9	Sesquiterpene hydrocarbon	21.65	1432	1436	MS, RI
(E)-β-Farnesene	18794-84-8	Sesquiterpene hydrocarbon	21.88	1448	1452	MS, RI, Std
α-Humulene	6753-98-6	Sesquiterpene hydrocarbon	22.18	1454	1452	MS, RI, Std
γ-Muurolene	30021-74-0	Sesquiterpene hydrocarbon	22.64	1472	1475	MS, RI
β-Selinene	17066-67-0	Sesquiterpene hydrocarbon	22.82	1485	1489	MS, RI
α-Selinene	473-13-2	Sesquiterpene hydrocarbon	23.01	1492	1496	MS, RI
(E,E)-α-Farnesene	502-61-4	Sesquiterpene hydrocarbon	23.12	1502	1505	MS, RI
β-Bisabolene	495-61-4	Sesquiterpene hydrocarbon	23.28	1506	1509	MS, RI
Zonarene	41943-79-7	Sesquiterpene hydrocarbon	23.36	1514	1522	MS, RI
Selina-3,7(11)-diene*	6813-21-4	Sesquiterpene hydrocarbon	23.95	1542	1547	MS, RI
Germacrene B	15423-57-1	Sesquiterpene hydrocarbon	24.22	1556	1561	MS, RI
Caryophyllene oxide	1139-30-6	Oxygenated sesquiterpene	24.84	1582	1581	MS, RI, Std



No.	Name
1	α-Pinene
2	Camphene
3	β-Pinene
4	Myrcene
5	Limonene
6	(E)-β-Ocimene
7	Fenchone
8	Linalool
9	RT 11.7
10	endo-Fenchol
11	cis-Pinene hydrate
12	trans-Pinene hydrate
13	α-Terpineol
14	α-Cubebene
15	α-Copaene
16	Hexyl hexanoate
17	(z)-β-Caryophyllene
18	(E)-β-Caryophyllene
19	γ-Elemene
20	α-trans-Bergamotene
21	(E)-β-Farnesene
22	α-Humulene
23	γ-Muurolene
24	β-Selinene
25	α-Selinene
26	(E,E)-α-Farnesene
27	β-Bisabolene
28	Zonarene
29	RT 23.4
30	Selina-3,7(11)-diene*
31	Germacrene B
32	Caryophyllene oxide
33	RT 26.8
34	Ethyl tetradecanoate

Figure 1- supplemental: Representative ion chromatogram of the GC-MS analysis of the inflorescence volatiles extracted using methyl tert-butyl ether (MTBE). Numbered peaks (1–34) correspond to the chemical constituents listed sequentially according to their chronological elution order.