Isomenthone chemotype

Pg23 Pg31 Pg33 Pg13

Pg19 Pg10 Pg14 Pg27 Pg32

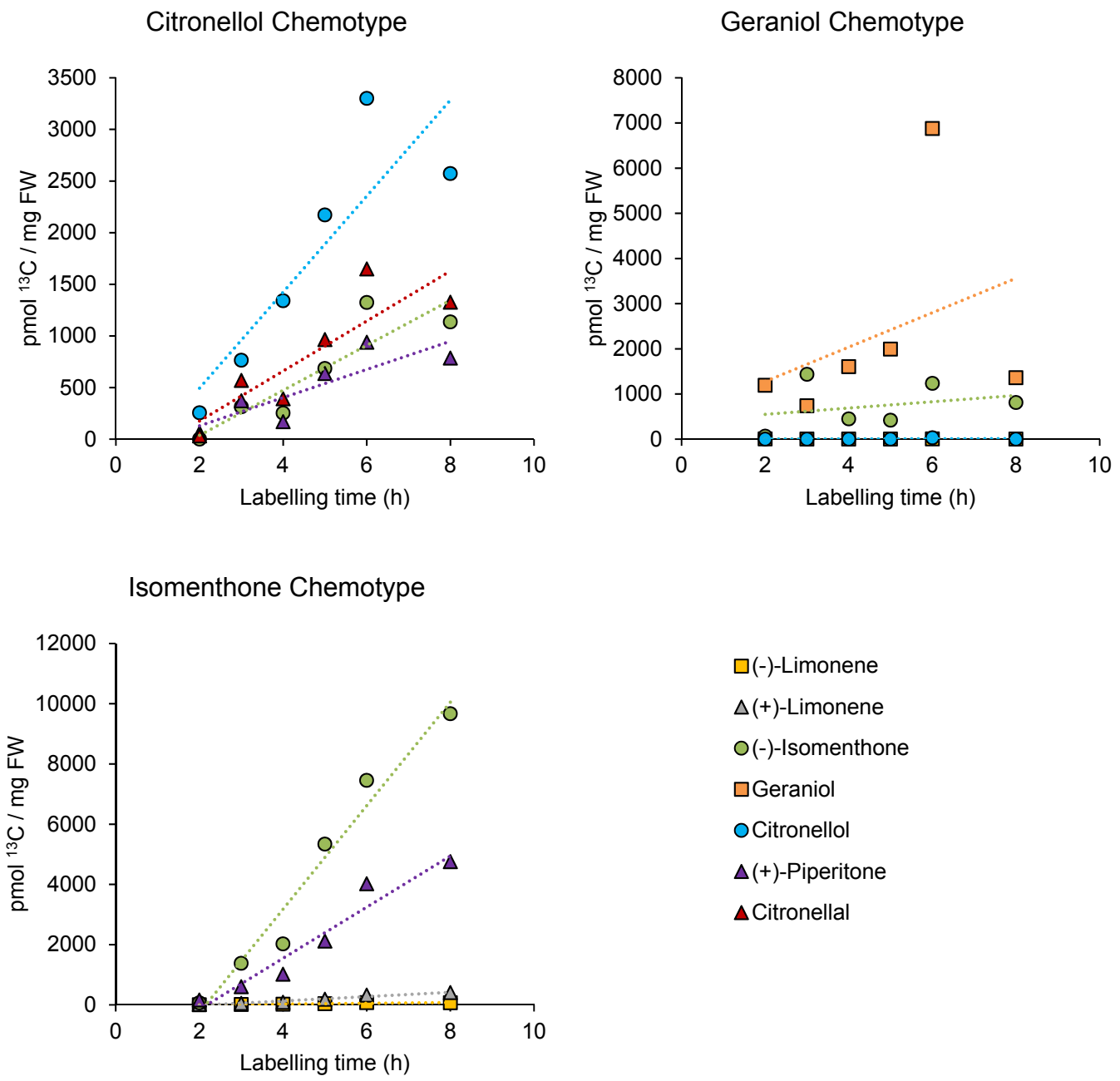
Citronellol chemotype

Pg12 Pg28 Pg30

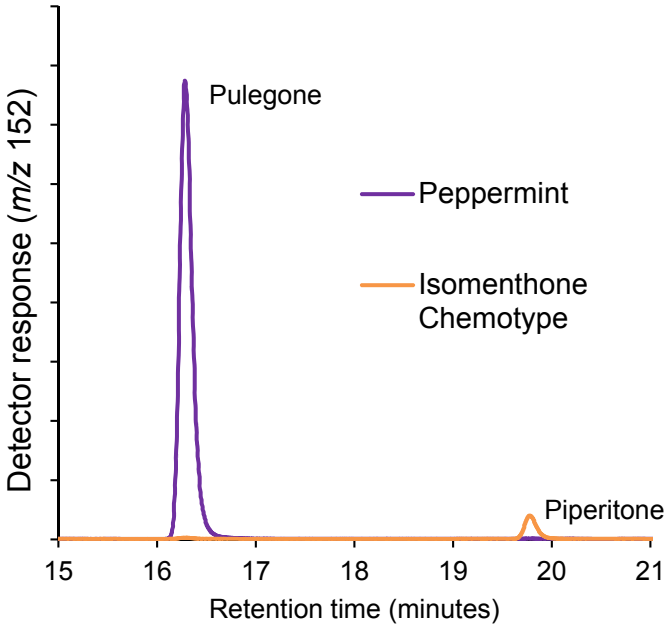
Geraniol chemotype

Pg15 Pg9

Supplemental Fig. S1. Leaf morphology of representative *P. graveolens* chemotypes. While minor differences were observed between individual lines, no consistent morphological differences which correlated with volatile profiles were observed.



Supporting figure S2. Time course labelling of monoterpene volatiles in *P. graveolens* chemotypes identified from a natural population. Plants were equilibrated in an illuminated dynamic flow cuvette with an air flow of 1.0 L·min^{-1} until a photosynthetic steady state was obtained, as judged by real time gas exchange measurements. Labeling in an atmosphere containing 400 p.p.m. $^{13}CO_2$ was initiated with a simple switch valve and carried out with groups of 4-6 plants at the same air flow, light intensity, and temperature (see Methods and Materials for additional details). The 3 youngest leaves were extracted in ethyl acetate, purified over a $MgSO_4$ Pasteur pipette column, and analyzed by GCMS. Each data point represents an individual, soil grown plant. Citronellol chemotype; citronellol: y = 465x – 436 (R^2 = 0.761), citronellal: y = 242x – 308 (R^2 = 0.746), (-)-isomenthone: y = 218x – 399 (R^2 = 0.805), (+)-piperitone: y = 136x – 144 (R^2 = 0.712). Geraniol chemotype; geraniol: y = 381x – 512 (R^2 = 0.130), (-)-isomenthone: y = 70x + 410 (R^2 = 0.505), citronellol: y = 2 – 3 (R^2 = 0.091), (+)-limonene: y = 4x – 7 (R^2 = 0.505), (-)-limonene: y = 0.1 – 0.8 (R^2 = 0.035). Isomenthone chemotype; (-)-isomenthone: y = 1719x – 3700 (R^2 = 0.965), (+)-piperitone: y = 849x – 1849 (R^2 = 0.939), (+)-limonene: y = 72x – 158 (R^2 = 0.955), (-)-limonene: y = 13x – 26 (R^2 0.871).



Supporting figure S3. SPME-GCMS trace of *p*-menthane volatiles from peppermint (purple line) and the isomenthone rich chemotype of *P. graveolens* (orange line). The mass trace for *m/z* 152 in SIM mode shows the separation of (+)-pulegone and (+)-piperitone in plant extracts. A 100 mg fresh tissue aliquot was incubated with a polydimethylsiloxane SPME fiber as described in methods and materials and injected manually into the GCMS. . (+)-Pulegone is readily detected in peppermint extracts but essentially absent from *P. graveolens*. For (+)-piperitone, the reverse is observed: it is easily detected in P. graveolens but present in only trace amounts in peppermint.