## **Supporting Information**

Becerra et al. 10.1073/pnas.0904456106

Noncard diferences 5esquienpenes Squitdefense Aromatic cuneata 10 heliae filicifolia 15 2 compacta macvaugh tomentos palmeri isthmica ribana bipinnata stenophyl hindsiare 11 2 14 11 hindsiana 13 10 bicolor sarukhanii 6 hintonii copallifera 13 5 2 velutina diversifolia diversifolia excelsa submoniliformis vejar-vazquezii coyucensis linanoe heteresthes xochipalensis glabrifolia graveolens fragantissima citronelja infiernidialis bonetti. 12 5 21 10 13 11 20 12 11 16 -2 5 14 Γ 4 Ł yes ፍ 13 11 9 243 10 6 5 10 6 5 epiņ 9 9 12 9 1 cerasitolia laxiflora sarcopoda tecomaca odorata occulta aptera trifoliolata 2 1 12 15 4 trifoliolata bolivarii laurihuertae schlechtendalii medranoana 2 yes yes yes medranoana chemapodicta fagaroides fag confusa paradoxa Bursera ves fagaroides purp 4 onidas staphyleo palaciosii 1 'multijuga denticulata 25 yes yes yes yes yes yes crenata fragilis morelen multifoli suntui arida rzedowski microphylla fagaroides cinerea longipes acuminata some populations some populations atenuata instabilis arborea 11 kruzei grandifolia inversa simaruba 7 2 5 10 60 80 40 20 MY 100

**Fig. S1.** Time-calibrated molecular phylogeny of *Bursera*, number of compounds of major types of volatiles found on species, and presence of the squirt response. Detailed information of phylogeny reconstruction can be found in refs. 1–4. Numbers on tree branches are bootstrap values. Species for which the number of compounds is denoted as – were not chemically analyzed.

- 1. Becerra JX (2003) Synchronous coadaptation in an ancient case of herbivory. Proc Natl Acad Sci USA 100:12804–12807.
- 2. Becerra JX (2005) Timing the origin and expansion of the Mexican tropical dry forest. Proc Natl Acad Sci USA 102:10919–10923.
- 3. Becerra JX (2003) Evolution of Mexican Bursera (Burseraceae) inferred from ITS, ETS, and 5S nuclear ribosomal DNA sequences. Mol Phylogenet Evol 26:300–309.
- 4. Becerra JX, Venable DL (1999) Nuclear ribosomal, DNA phylogeny and its implications for evolutionary trends in Mexican Bursera (Burseraceae). Am J Bot 86:1047–1057.

## Table S1. Analyses of plant chemical diversity and complexity by using maximum-likelihood models

Plant chemical diversity Section Bullockia (log-transformed data) Log-likelihood of: Model A (random walking): -7.52 Model B (directional): -3.63;  $\beta$  (slope) = 1,805.17 LR = 7.78, P = 0.005, df = 1 Scaling parameters included in models:  $\kappa = 3.00$  $\lambda = 0.00$ Section Bursera, including squirting Bursera species (log-transformed data) Log-likelihood of: Model A (random walking): -15.80 Model B (directional): -15.53;  $\beta$  (slope) = 2.833 LR = 0.54, P = 0.46, df = 1 Scaling parameters included in models:  $\kappa = 3.00$  $\lambda = 0.00$ Section Bursera, excluding squirting Bursera species (log-transformed data) Log-likelihood of: Model A (random walking): -13.61 Model B (directional): -11.66;  $\beta$  (slope) = 8.79 LR = 3.9, P = 0.047, df = 1 Scaling parameters included in models:  $\lambda = 0.11$ Plant chemical complexity Section Bullockia log-likelihood of: Model A (random walking): -24.91 Model B (directional): -21.44;  $\beta$  (slope) = 3375.98 LR = 6.94, P = 0.008, df = 1Scaling parameters included in models:  $\kappa = 3.00$  $\lambda = 0.00$ Section Bursera, including squirting Bursera species log-likelihood of: Model A (random walking): -37.56 Model B (directional): 35.48;  $\beta$  (slope) = 15.58 LR = 4.14, P = 0.04, df = 1 Scaling parameters included in models:  $\kappa = 3.00$  $\lambda = 0.00$ Section Bursera, excluding squirting Bursera species Log-likelihood of: Model A (random walking): -28.47 Model B (directional): -23.68;  $\beta$  (slope) = 23.25 LR = 9.57, P = 0.002, df = 1 Scaling parameters included in models:  $\lambda = 0.05$ 

## Table S2. Shannon's index based on the presence or absence of the four kinds of chemical compounds

Compound	Species		
	A	В	C
Mono/diterpenes	1	1	1
Sesquiterpenes	0	1	1
Aromatic	0	0	1
Alakanes	0	1	0
$H_A = -\Sigma p \ln p$	0	1.10	1.10

A Shannon's diversity index was calculated for each species based only on whether they produce (score 1) or not (score 0) any of each of these four kinds of compounds.

Table S3. Shannon's index based on the relative concentrations of individual comp	ວounds
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Compound	Species		
	А	В	C
Mono/Diterpenes			
1	0.1	0.1	0.5
2	0.7		0.1
3	0.2		0.1
Sesquiterpenes			
1		0.7	0.2
2			
Aromatic			
1			0.1
2			
3			
Alakanes		0.2	
1			
2			
$H_B = -\Sigma p \ln p$	0.80	0.80	1.36

A Shannon's diversity index was calculated for each species based on the relative concentration of all individual compounds, independently of the biochemical pathway they belong to.

## Table S4. Index of chemical complexity calculated from Tables S2 and S3

Chemical complexity index	Species		
	A	В	С
$H_A + H_B$	0.80	1.90	2.46

The index of chemical complexity for each species was obtained by adding the two Shannon's indexes. Species B has greater complexity than A because it produces more kinds of compounds. Species C has greater complexity than B because it has a greater number of individual compounds with more even concentration.