

SUPPLEMENTARY MATERIAL

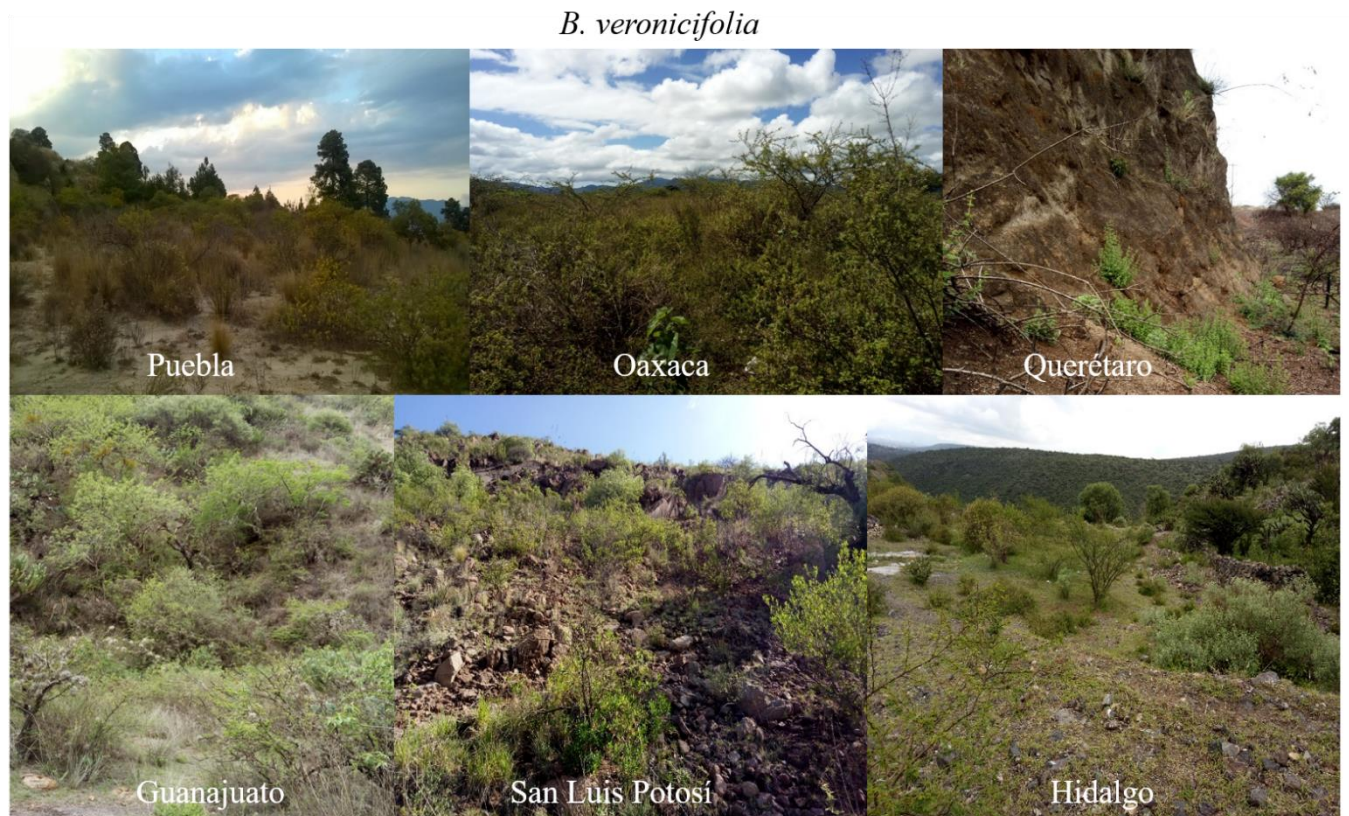


Figure S1: *Brickellia veronicifolia* grown in xerophytic shrublands located in different provinces from Mexico.

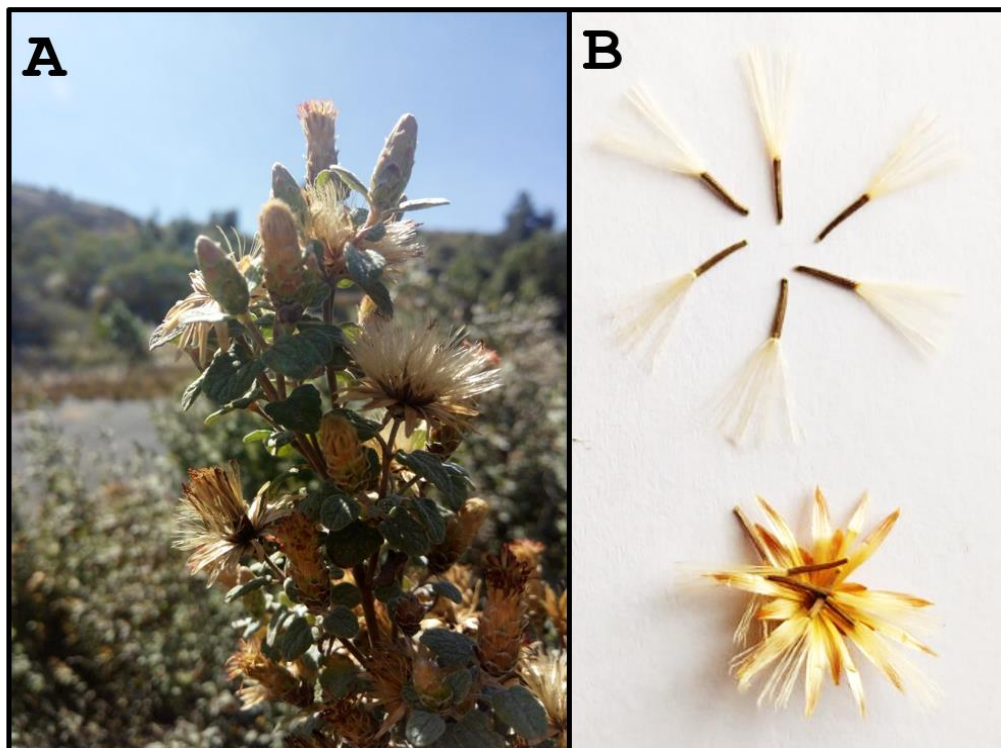


Figure S2: A) Inflorescences of *B. veronicifolia* under wild conditions, B) Winged achenes of *B. veronicifolia*.

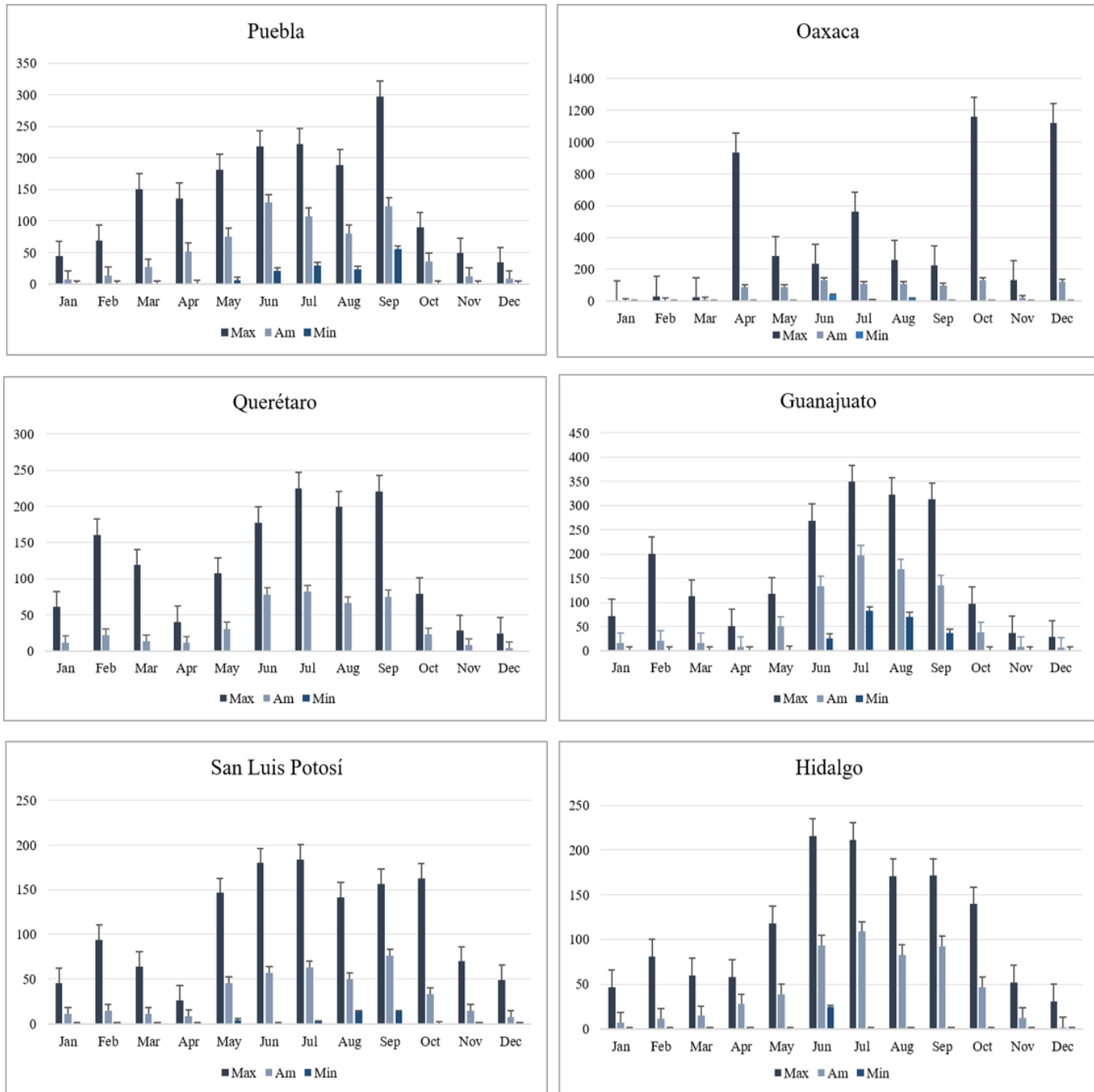


Figure S3: Monthly precipitation (mm; 2000-2017) for different populations of *B. veronicifolia* grown in Mexico (CONAGUA, 2018).

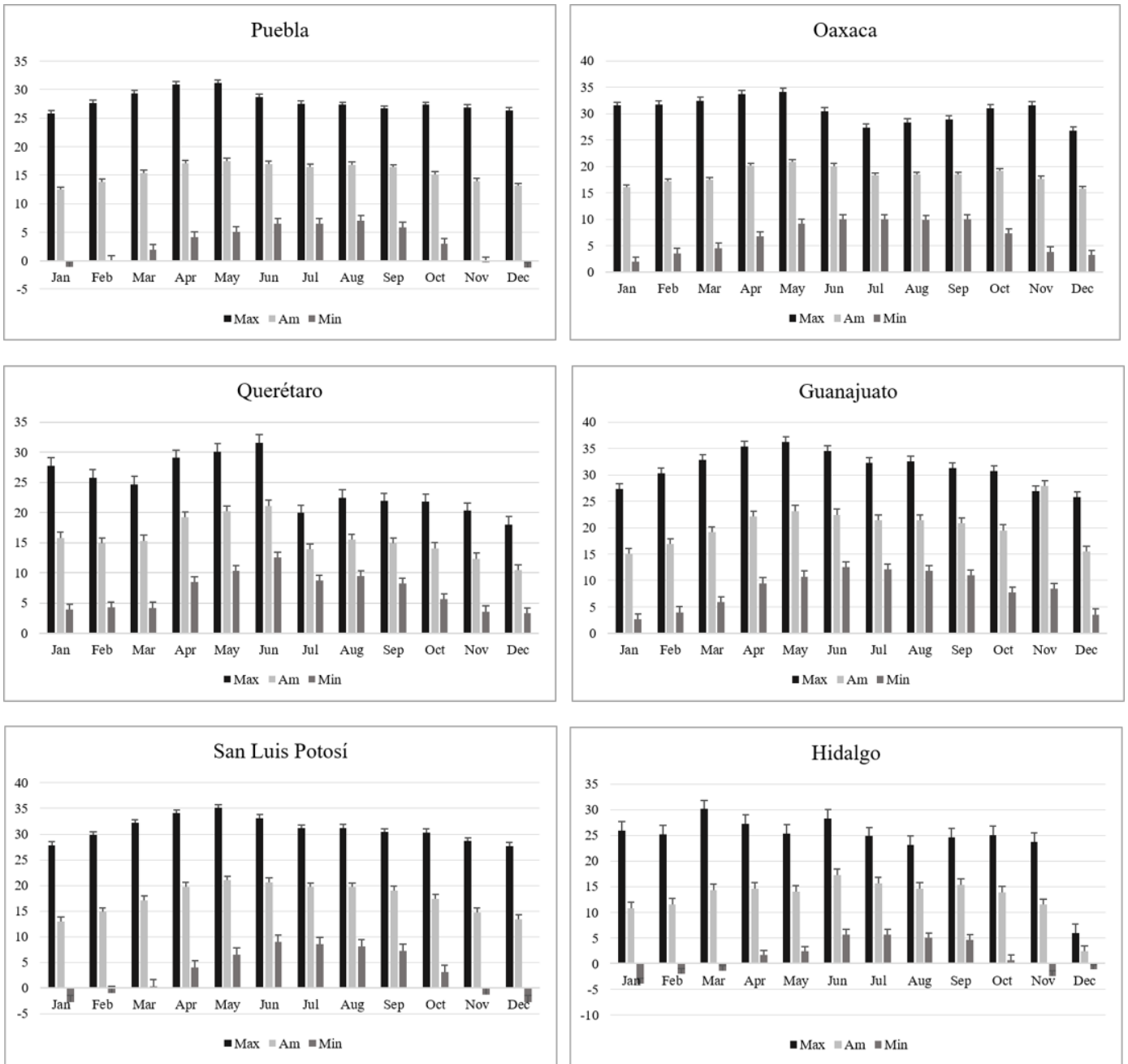


Figure S4: Monthly temperature variation (°C) from 2000-2017 by *B. veronicifolia* studied population (CONAGUA, 2018).

Table S1: Volatile constituents of the essential oil from *Brickellia veronicifolia* by population.

# Peak	RT mean	Compound	PUEBLA			OAXACA			QUERETARO			GUANAJUATO			SAN LUIS POTOSÍ			HIDALGO		
			RRI-1	RRI-2	(%) RA	RRI-1	RRI-2	(%) RA	RRI-1	RRI-2	(%) RA	RRI-1	RRI-2	(%) RA	RRI-1	RRI-2	(%) RA	RRI-1	RRI-2	(%) RA
1	8.50	D-Limonene	-	-	-	1024.2	1031.0	0.25±0.2	-	-	-	-	-	-	-	-	-	-	-	-
2	11.88	β-Linalool	1099.6	1098.0	0.08 ±0.4	1099.7	1098.0	0.09±0.2	1099.6	1098.0	0.07±0.0	1099.8	1098.0	0.06±0.0	1099.6	1098.0	0.11±0.0	1099.5	1098.0	0.11±0.0
3	12.43	Isopulegol	-	-	-	1117.6	1145.0	0.03±0.0	-	-	-	-	-	-	1118.1	1145.0	0.02±0.0	-	-	-
4	12.82	cis-Carvotanacetol	1166.8	1199.0	0.01±0.0	-	-	-	1117.8	1199.0	0.01±0.0	1117.5	1199.0	0.02±0.0	1117.8	1199.0	0.01±0.0	-	-	-
5	13.47	cis-Verbenol	-	-	-	-	-	-	1149.8	1142.0	0.07±0.0	-	-	-	1149.8	1142.0	0.05±0.0	1149.8	1142.0	0.02±0.0
6	13.98	cis-Carveol	1167.2	1229.0	0.01±0.0	-	-	-	1246.2	1229.0	0.02±0.0	1139.3	1229.0	0.02±0.0	1127.1	1229.0	0.01±0.0	-	-	-
7	14.18	(±)-Lavandulol	-	-	-	-	-	-	-	-	-	-	-	-	1172.2	1166.0	0.08±0.0	-	-	-
8	14.19	cis-Geraniol	-	-	-	-	-	-	1172.7	1240.0	0.02±0.0	1172.7	1240.0	0.01±0.0	1172.7	1240.0	0.03±0.0	1172.7	1240.0	0.02±0.0
9	14.20	cis-2-p-Menthen-1-ol	-	-	-	-	-	-	1173.0	1166.0	0.02±0.0	-	-	-	-	-	-	-	-	-
10	14.20	5-Caranol, trans,trans-(+)-	-	-	-	-	-	-	1173.0	1286.0	0.01±0.0	-	-	-	-	-	-	-	-	-
11	14.41	Terpinen-4-ol	1179.7	1177.0	0.01±0.0	-	-	-	1179.7	1177.0	0.05±0.0	1179.8	1177.0	0.02±0.0	1179.6	1177.0	0.14±0.0	1179.7	1177.0	0.06±0.0
12	14.60	p-Menth-8(10)-ene- 2,9-diol	1185.9	1179.0	0.02±0.1	1176.5	1179.0	0.04±0.0	1186.0	1179.0	0.04±0.0	1186.0	1179.0	0.04±0.0	-	-	-	1185.9	1179.0	0.01±0.0
13	14.62	p-Cymen-8-ol	-	-	-	-	-	-	1186.2	1183.0	0.09±0.0	-	-	-	1186.3	1183.0	0.14±0.0	-	-	-
14	14.76	α-Terpineol	1190.9	1198.0	0.02±0.0	-	-	-	1191.1	1198.0	0.03±0.0	1191.0	1198.0	0.01±0.0	1191.0	1198.0	0.06±0.0	1191.0	1198.0	0.04±0.0
15	14.90	Myrtenol	-	-	-	-	-	-	1195.2	1194.0	0.06±0.0	-	-	-	1194.6	1194.0	0.14±0.0	1195.3	1194.0	0.05±0.0
16	15.09	endo-Borneol	-	-	-	-	-	-	1201.6	1165.0	0.03±0.0	-	-	-	-	-	-	-	-	-
17	15.22	Verbenone	-	-	-	-	-	-	1208.0	1204.0	0.05±0.0	1208.1	1204.0	0.05±0.0	1208.1	1204.0	0.07±0.0	1208.0	1204.0	0.04±0.0

18	15.22	Ascaridole epoxide	-	-	-	-	-	-	-	-	1208.1	1296.0	0.01±0.0	-	-	-	-	-	-	
19	15.85	cis-3-Hexenyl isovalerate	1236.2	1241.0	0.02±0.1	-	-	-	1239.3	1241.0	0.04±0.0	1239.5	1241.0	0.02±0.0	1239.3	1241.0	0.04±0.0	1237.7	1241.0	0.02±0.0
20	16.01	D-Carvone	-	-	-	-	-	-	-	-	-	-	-	1246.0	1243.0	0.01±0.0	-	-	-	
21	16.10	cis-3-Hexenyl valerate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1250.4	1230.0	0.06±0.0	
22	16.15	p-Menthane-1,2,3- triol	-	-	-	-	-	-	1252.7	1485.0	0.02±0.0	1252.9	1485.0	0.01±0.0	-	-	-	-	-	-
23	16.69	β-citral	1273.0	1240.0	0.01±0.0	-	-	-	-	-	-	-	-	1273.0	1240.0	0.11±0.0	1279.5	1240.0	0.01±0.0	
24	16.80	Carotol	-	-	-	-	-	-	1292.5	1549.0	0.02±0.0	-	-	-	-	-	-	-	-	
25	17.57	Myrtenyl acetate	-	-	-	-	-	-	1327.0	1235.0	0.08±0.0	-	-	-	1327.3	1235.0	0.37±0.4	-	-	-
26	17.64	Isolongifolene	1335.9	1387.0	0.03±0.0	-	-	-	1327.3	1387.0	0.07±0.0	-	-	-	-	-	-	-	-	
27	17.70	(+)-Sativene	-	-	-	1337.9	1339.0	0.02±0.0	1336.4	1339.0	0.02±0.0	1336.4	1339.0	0.02±0.0	1328.9	1339.0	0.03±0.0	1337.4	1339.0	0.02±0.0
28	17.81	γ-Elemene	1340.5	1430.0	1.10±1.7	1343.4	1430.0	0.05±0.0	1340.2	1430.0	0.06±0.0	1340.4	1430.0	0.09±0.0	-	-	-	1344.0	1430.0	2.84±1.6
29	18.00	α-Cubebene	-	-	-	1353.5	1351.0	0.92±1.1	1352.9	1351.0	0.37±0.2	1352.9	1351.0	0.09±0.2	-	-	-	1353.1	1351.0	0.47±0.2
30	18.06	α-Longipinene	1358.8	1351.0	0.38±0.3	-	-	-	-	-	-	-	-	1355.9	1351.0	0.94±1.1	-	-	-	
31	18.16	β-Neoclovene	1363.1	1454.0	0.17±0.0	1363.0	1454.0	0.01±0.0	-	-	-	-	-	1362.6	1454.0	0.38±0.2	-	-	-	
32	18.16	Isocaryophyllene	-	-	-	1363.2	1407.0	0.01±0.0	-	-	-	-	-	-	-	-	-	-	-	
33	18.28	(+)- Longifolene	-	-	-	-	-	-	-	-	-	-	-	1370.5	1402.0	0.27±0.3	-	-	-	
34	18.28	(+)-Cyclosativene	1370.3	1367.0	0.74±0.2	-	-	-	-	-	-	-	-	-	-	-	1370.3	1367.0	0.06±0.1	
35	18.33	α-ylangene	1361.3	1382.0	1.02±1.4	1376.0	1382.0	0.16±0.1	1379.7	1382.0	1.82±0.0	1375.0	1382.0	0.06±0.0	1373.8	1382.0	0.11±0.0	1375.2	1382.0	0.01±0.0
36	18.26	Longicyclene	-	-	-	1363.1	1373.0	0.02±0.0	-	-	-	-	-	-	1374.9	1373.0	0.21±0.1	-	-	-
37	18.45	α-copaene	1381.7	1376.0	2.56±1.8	1380.4	1376.0	1.02±0.3	1384.1	1376.0	0.31±0.6	1379.6	1376.0	1.78±1.0	1379.4	1376.0	1.28±0.3	1379.6	1376.0	1.65±0.6
38	18.36	α-Gurjunene	1335.5	1409.0	0.14±0.0	1412.4	1409.0	0.18±0.0	-	-	-	-	-	-	-	-	-	1413.8	1409.0	0.33±0.0

60	19.51	Aromandendrene	1440.5	1440.0	0.45±0.0	1441.4	1440.0	0.70±0.5	1440.2	1440.0	0.34±0.1	1444.4	1440.0	0.77±0.8	1440.2	1440.0	0.26±0.2	1440.6	1440.0	0.37±0.0
61	19.78	Humulene	1455.5	1440.0	1.55±0.7	1459.6	1440.0	1.82±0.7	1455.2	1440.0	1.28±0.4	1455.1	1440.0	0.89±0.9	1455.2	1440.0	0.90±0.5	1455.7	1440.0	1.64±0.8
62	20.12	γ-Murolene	1480.4	1477.0	1.20±1.7	1454.1	1477.0	3.59±1.4	1478.7	1477.0	1.77±0.5	1478.6	1477.0	1.01±0.9	1478.6	1477.0	1.33±0.5	1479.9	1477.0	0.48±1.6
63	20.44	(+)-Ledene	1487.4	1493.0	0.38±0.2	1441.7	1493.0	1.19±2.0	1485.3	1493.0	0.16±0.1	1435.9	1493.0	0.01±0.0	1468.8	1493.0	0.36±0.0	1487.3	1493.0	0.37±5.6
64	20.50	α-Curcumene	-	-	-	1484.7	1483.0	2.14±0.1	-	-	-	-	-	-	1505.4	1483.0	1.74±0.8	-	-	-
65	20.64	γ-Elemene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1502.2	1430.0	0.92±3.7
66	20.63	Cubedol	1501.0	1580.0	5.59±4.4	1500.6	1580.0	4.54±0.8	1501.1	1580.0	7.15±6.1	1500.3	1580.0	6.51±6.6	1500.7	1580.0	7.45±4.5	1505.6	1580.0	9.07±3.7
67	20.84	γ-Cadinene	1516.9	1513.0	1.85±1.7	1518.4	1513.0	4.55±2.6	-	-	-	-	-	-	1516.4	1513.0	1.94±0.5	1484.3	1513.0	18.32±2.2
68	20.86	α-Himachalene	-	-	-	1511.6	1447.0	0.25±0.2	-	-	-	-	-	-	1509.7	1447.0	0.30±0.1	-	-	-
69	21.19	trans-calamenene	-	-	-	-	-	-	-	-	-	1523.6	1528.0	1.27±0.7	1524.1	1528.0	1.32±0.7	-	-	-
70	21.21	(+)-δ-Cadinene	1524.6	1524.0	5.40±2.4	1525.4	1524.0	2.44±1.5	1525.9	1524.0	1.88±0.4	1526.1	1524.0	1.93±1.1	-	-	-	1524.4	1524.0	3.03±3.7
71	21.37	α-acorenol	-	-	-	-	-	-	1509.2	1629.0	0.13±0.0	1340.6	1629.0	0.02±0.0	1645.4	1629.0	2.11±1.4	1554.5	1629.0	0.79±0.3
72	21.55	γ-Himachalene	-	-	-	-	-	-	-	-	-	-	-	-	1537.8	1475.0	0.37±0.2	-	-	-
73	21.54	α-Cadinene	1537.1	1538.0	0.56±0.2	1537.1	1538.0	0.14±0.0	-	-	-	-	-	-	-	-	-	1537.8	1538.0	1.18±0.1
74	21.74	4-epi-cubedol	1550.4	1494.0	1.45±2.5	1525.3	1494.0	0.18±0.1	1559.6	1494.0	0.20±0.1	1534.8	1494.0	0.63±0.2	1582.6	1494.0	0.19±0.1	1531.2	1494.0	0.02±0.0
75	21.81	Murolan-3,9(11)-diene-10-peroxy	-	-	-	-	-	-	-	-	-	-	-	-	1548.1	1730.0	0.46±1.0	-	-	-
76	21.88	Longiverbenone	-	-	-	-	-	-	1541.2	2148.0	0.76±0.7	1560.5	2148.0	0.08±0.1	-	-	-	-	-	-
77	22.04	6-epi-shyobunol	-	-	-	-	-	-	-	-	-	-	-	-	1319.1	1517.0	0.01±0.0	1691.1	1517.0	1.77±0.2
78	22.16	Nerolidyl acetate	-	-	-	-	-	-	1562.1	1675.0	1.27±0.4	1561.5	1675.0	0.74±0.2	-	-	-	1561.8	1675.0	0.07±0.3
79	22.27	Nerolidol	-	-	-	-	-	-	1565.1	1560.0	0.14±0.2	-	-	-	1564.7	1560.0	1.07±0.7	1569.0	1560.0	0.18±0.3
80	22.34	Aristolene epoxide	1568.7	1747.0	0.14±0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
81	22.35	Epiglobulol	-	-	-	-	-	-	-	-	-	-	-	-	1569.4	1588.0	0.88±0.7	-	-	-

82	22.51	Globulol	1576.0	1576.0	0.33±0.4	1583.1	1576.0	0.70±0.0	1576.8	1576.0	1.75±0.6	1568.4	1576.0	0.79±0.4	1574.8	1576.0	0.76±0.5	1571.7	1576.0	8.08±4.4
83	22.77	(-)-Spathulenol	1584.6	1576.0	13.74±5.8	1586.7	1576.0	18.34±6.7	1585.2	1576.0	14.93±1.4	1583.6	1576.0	11.47±4.5	1587.0	1576.0	11.17±5.8	1586.5	1576.0	7.44±3.4
84	22.91	Caryophyllene oxide	1590.2	1581.0	9.82±2.2	1592.2	1581.0	15.95±2.8	1590.1	1581.0	20.14±3.9	1589.4	1581.0	19.31±5.0	1592.0	1581.0	15.73±11.9	1592.9	1581.0	2.92±5.5
85	23.11	Ledol	1597.8	1565.0	1.28±0.3	1598.9	1565.0	0.90±0.6	1598.0	1565.0	1.80±0.9	1597.2	1565.0	0.90±0.5	1599.2	1565.0	1.74±1.0	1600.5	1565.0	2.02±0.3
86	23.22	Guaiol	-	-	-	-	-	-	-	-	-	1602.2	1595.0	0.16±0.3	-	-	-	-	-	-
87	23.43	Viridiflorol	1607.5	1590.0	1.10±0.7	-	-	-	1607.3	1590.0	1.93±1.0	-	-	-	-	-	-	1608.3	1590.0	0.28±0.8
88	23.49	Humulene-1,6-dien-3-ol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1609.1	1619.0	0.61±1.2
89	23.67	Calarene epoxide	1612.9	1671.0	0.24±0.7	-	-	-	1613.3	1671.0	0.50±0.7	1615.3	1671.0	0.11±0.1	-	-	-	-	-	-
90	23.88	Drimenol	-	-	-	-	-	-	1619.2	1752.0	0.86±0.2	-	-	-	1619.4	1752.0	0.83±0.4	1619.8	1752.0	0.09±0.3
91	24.14	Diepicedrene-1-oxide	-	-	-	1614.0	1548.0	0.24±0.7	1611.8	1548.0	2.12±1.2	1611.2	1548.0	0.80±1.0	1612.0	1548.0	2.56±1.5	1681.9	1548.0	1.00±0.1
92	24.05	9-Methoxycalamene	1542.5	1484.0	0.61±0.3	-	-	-	1664.8	1484.0	0.53±0.3	1664.9	1484.0	0.42±0.2	1666.2	1484.0	0.47±0.2	1542.7	1484.0	0.85±0.0
93	24.31	β-Ionol	-	-	-	-	-	-	1630.8	1406.0	0.30±0.1	1630.3	1406.0	0.42±0.1	-	-	-	-	-	-
94	24.61	Alloaromadendrene oxide	1624.6	1625.0	0.62±0.6	1669.9	1625.0	0.14±0.0	1625.1	1625.2	0.95±0.8	-	-	-	1606.3	1625.0	0.27±0.4	-	-	-
95	24.67	tau-Muurolol	1640.5	1640.0	8.88±5.6	1638.1	1640.0	2.57±5.6	1640.6	1640.0	6.01±3.0	1640.4	1640.0	4.11±3.6	1639.6	1640.0	5.99±4.6	1640.8	1640.0	1.28±3.8
96	24.73	tau-cadinol	1641.1	1642.0	1.80±5.5	1642.8	1642.0	4.82±1.6	-	-	-	-	-	-	1640.8	1642.0	11.67±3.4	-	-	-
97	24.77	(-)-Isolongifolol	1636.9	1723.0	0.52±0.5	1630.5	1723.0	0.81±0.8	1663.5	1723.0	0.52±0.2	1640.6	1723.0	1.32±0.5	1644.5	1723.0	1.00±2.5	1662.4	1723.0	0.77±0.2
98	24.80	(-)-δ-Cadinol	-	-	-	-	-	-	-	-	-	-	-	-	1643.2	1636.0	1.43±1.0	-	-	-
99	24.83	δ-Cedrol	1644.2	1621.0	1.37±0.8	1643.4	1621.0	0.75±0.8	1643.8	1621.0	2.88±2.6	1644.9	1621.0	2.40±2.3	1644.3	1621.0	1.43±0.7	1644.7	1621.0	2.20±1.0
100	25.01	Z-9-Pentadecenol	-	-	-	-	-	-	1648.3	1742.0	1.25±0.4	1648.4	1742.0	0.61±0.5	1648.5	1742.0	0.66±0.3	1650.0	1742.0	2.24±0.2
101	25.15	α-Cadinol	1654.6	1653.0	9.91±1.7	1653.2	1653.0	1.694±2.3	1652.5	1653.0	7.18±3.3	1652.3	1653.0	5.96±3.2	1650.8	1653.0	5.80±1.9	1651.7	1653.0	11.68±3.5
102	25.75	Longifolenaldehyde	1603.9	1601.0	1.26±0.5	1604.3	1601.0	0.10±0.0	1602.4	1601.0	0.70±0.3	1600.5	1601.0	0.36±0.2	1717.6	1601.0	0.16±0.1	1662.2	1601.0	0.44±0.2

103	25.84	Patchoulol	-	-	-	-	-	-	-	-	-	-	-	-	1670.5	1664.0	1.02±0.5	-	-	-
104	26.25	α-Bisabolol	-	-	-	-	-	-	-	-	-	1681.0	1683.0	0.29±0.2	1681.5	1883.0	0.40±0.4	1681.3	1683.0	0.11±0.3
105	26.97	Aromadendrene oxide	1747.4	1702.0	0.20±0.0	1728.9	1702.0	0.19±0.4	-	-	-	1748.4	1702.0	0.68±0.4	1767.8	1702.0	0.31±0.1	1662.2	1702.0	1.09±0.4
106	29.25	Corymbolone	1740.2	1892.0	0.35±0.2	1721.7	1892.0	0.83±0.1	1737.8	1892.0	0.37±0.3	-	-	-	1738.1	1892.0	0.12±0.2	1800.9	1892.0	0.02±0.0
107	30.23	cis-Z-α-Bisabolene epoxide	-	-	-	1778.6	1743.0	0.14±0.3	1777.2	1743.0	0.59±0.1	1777.4	1743.0	0.54±0.2	1775.9	1743.0	0.55±0.1	-	-	-
108	33.29	Geranyl-p-cymene	1959.1	2006.0	0.36±0.2	-	-	-	-	-	-	-	-	-	1959.1	2006.0	0.07±0.0	1959.1	2006.0	0.03±0.1

Compounds identified by the estimation of RRI-1 and RRI-2, relative retention index for DB-5 and HP-5 columns, respectively. (%) RA: relative abundance. A dash (-) indicates the absence of the component. Shadow areas show the 6 more abundant compounds and enclosed are the specific compounds of each population.

Table S2: iPBS primers used in the detection of polymorphism among six populations of *Brickellia veronicifolia*.

iPBS Marker	Sequence (5'-3')	Ta (°C)
1846	CTGGCATTTCATTGTTCGTCGATGC	55.5
1880	GAACTCCCTGGTGGCATCGTGAGC	60.5
2074	GCTCTGATACCA	50.0
2075	CTCATGATGCCA	51.2
2076	GCTCCGATGCCA	49.0
2077	CTCACGATGCCA	50.5
2078	GCGGAGTCGCCA	55.0
2080	CAGACGGCGCCA	55.0
2081	GCAACGGCGCCA	58.0
2232	AGAGAGGCTCGGATACCA	53.0
2249	AACCGACCTCTGATACCA	51.0
2378	GGTCCTCATCCA	53.0

Ta: alignment temperature