

Table S1: Aroma-active compounds identified in cocoa pulps grown in Indonesia, Vietnam, Cameroon and Nicaragua by means of SBSE-GC-MS

No. <sup>a</sup>	Odorant <sup>b</sup>	Molecular weight [g/mol]	Odor Quality <sup>c</sup>	retention index on
				DB-FFAP
1	methyl 2-methylbutanoate	116.16	fruity, banana-like	1017
2	hexanal	100.16	green	1089
3	(-)-beta-pinene <sup>d</sup>	136.23	green, eucalyptus-like	1101
4	3-methylbutyl acetate	130.18	fruity	1118
5	δ-carene	136.23	green	1140
6	R-(+)-limonene <sup>d</sup>	184.23	citrus-like	1189
7	3-methylbutanol	88.15	malty, roasty	1200
8	2-heptanone	114.19	fruity, flowery	1207
9	pentan-1-ol <sup>d</sup>	88.15	fruity	1241
10	octanal	128.21	citrus-like, green	1280
11	(E)-2-heptenal	112.17	green, flowery	1311
12	1-hexanol	102.17	green, grassy	1338
13	nonanal	142.24	citrus-like, soapy	1376
14	(E)-2-octenal	126.2	fatty, grassy, green	1417
15	acetic acid	60.05	vinegar-like	1430
16	(E,E)-2,4-heptadienal	110.15	fatty, roasty	1486
17	(Z)-2-nonenal	140.22	green, fatty	1494
18	benzaldehyde <sup>d</sup>	106.12	almond-like	1515
19	(E)-2-nonenal	140.22	fatty, cardboard-like	1524
20	linalool	154.25	flowery	1539
21	1-octanol <sup>d</sup>	130.23	soapy, green	1545
22	(E,Z)-2,6-nonadienal	138.21	cucumber-like, fatty	1574
23	(E)-2-decenal	154.25	green, fatty	1616
24 a/b	2- and 3-methylbutanoic acid	102.13	rancid, cheesy	1662
25	(E,E)-2,4-nonadienal	138.21	fatty, deep fried	1696
26	pentanoic acid <sup>d</sup>	102.13	fruity	1702
27	(E,E)-2,4-decadienal	152.23	fatty	1800
28	2-methoxyphenol	124.14	smoky, ham-like	1848
29	2-phenylethanol	122.16	rose-like, flowery	1897
30	4-hydroxy-2,5-dimethyl-3(2H)-furanone	128.13	caramel-like	2026
31	2,3-dimethylphenol	122.16	phenolic	2109
32	4-vinyl-2-methoxyphenol	150.17	smoky, clove-like	2128
33	3-hydroxy-4,5-dimethylfuran-2(5H)-one	128.13	maggi-like, celery-like	2194
34	undecanoic acid	186.29	soapy, coriander-like	2323
35	4-methoxyphenol	124.14	phenolic	2388
36	dodecanoic acid	200.32	fatty, wax-like	2496
37	phenylacetic acid	136.15	honey-like	2545

<sup>a</sup> Consecutive numbering of odorants according to their retention indices on capillary column DB-FFAP. <sup>b</sup> Odorant was identified by comparison of its odor quality and intensity, retention indices on capillary DB-FFAP as well as mass spectra (EI mode) with data of reference compounds. <sup>c</sup> Odor quality perceived at the odor detection port. <sup>d</sup> Odorant not determined in the cocoa pulp extracts with a factor of FD>2

Table S2: Aroma-active compounds identified in cocoa pulps grown in Indonesia, Vietnam, Cameroon and Nicaragua by means of HS-SPME-GC-MS

					retention index on
No. <sup>a</sup>	Odorant <sup>b</sup>	Molecular weight [g/mol]	Odor Quality <sup>c</sup>		DB-FFAP
1	2,3-pentanedione	100.12	butter		1056
2	hexanal	100.16	green		1089
3	(-)-beta-pinene <sup>d</sup>	136.23	green, eucalyptus-like		1101
4	3-methylbutyl acetate	130.18	fruity		1118
5	p-xylene <sup>d</sup>	106.16	green		1130
6	δ-carene	136.23	green		1140
7	myrcene <sup>d</sup>	136.23	earthy, geranium-like		1160
8	R-(+)-limonene <sup>d</sup>	184.23	citrus-like		1189
9	3-methylbutanol	88.15	malty, roasty		1200
10	2-heptanone	114.19	fruity, flowery		1207
11	pentan-1-ol <sup>d</sup>	88.15	fruity		1241
12	octanal	128.21	citrus-like, green		1280
13	(E)-2-heptenal	112.17	green, flowery		1311
14	1-hexanol	102.17	green, grassy		1338
15	nonanal	142.24	citrus-like, soapy		1376
16	(E)-2-octenal	126.2	fatty, grassy, green		1417
17	acetic acid	60.05	vinegar-like		1430
18	(E,E)-2,4-heptadienal	110.15	fatty, roasty		1486
19	(Z)-2-nonenal	140.22	green, fatty		1494
20	benzaldehyde <sup>d</sup>	106.12	almond-like		1515
21	(E)-2-nonenal	140.22	fatty, cardboard-like		1524
22	linalool	154.25	flowery		1539
23	1-octanol	130.23	soapy, green		1545
24	2-methylpropanoic acid	88.15	cheesy		1562
25	(E,Z)-2,6-nonadienal	138.21	cucumber-like, fatty		1574
26	acetophenone <sup>d</sup>	120.15	marzipan-like, flowery		1611
27	(E)-2-decenal	154.25	green, fatty		1616
28 a/b	2- and 3-methylbutanoic acid	102.13	rancid, cheesy		1662
29	alpha terpineol <sup>d</sup>	154.25	eucalyptus-like, mint-like		1675
30	(E,E)-2,4-nonadienal	138.21	fatty, deep fried		1696
31	2-undecanol <sup>d</sup>	172.31	soapy		1706
32	(E,E)-2,4-decadienal	152.23	fatty		1800
33	2-methoxyphenol	124.14	smoky, ham-like		1848
34	2-phenylethanol	122.16	rose-like, flowery		1897
35	4-methylhexanoic acid	130.18	sweaty, fishy		2011
36	4-hydroxy-2,5-dimethyl-3(2H)-furanone	128.13	caramel-like		2026
37	octanoic acid	144.21	green, soapy		2043
38	4-methylphenol	108.14	fecal		2073
39	3-hydroxy-4,5-dimethylfuran-2(5H)-one	128.13	maggi-like, celery-like		2194
40	undecanoic acid	186.29	soapy, coriander-like		2323

<sup>a</sup> Consecutive numbering of odorants according to their retention indices on capillary column DB-FFAP. <sup>b</sup> Odorant was identified by comparison of its odor quality and intensity, retention indices on capillary DB-FFAP as well as mass spectra (EI mode) with data of reference compounds. <sup>c</sup> Odor quality perceived at the odor detection port. <sup>d</sup> Odorant not determined in the cocoa pulp extracts with a factor of FD>2